THE SCOTTISH GEOGRAPHICAL MAGAZINE

Volume 71, No. 3 December 1955

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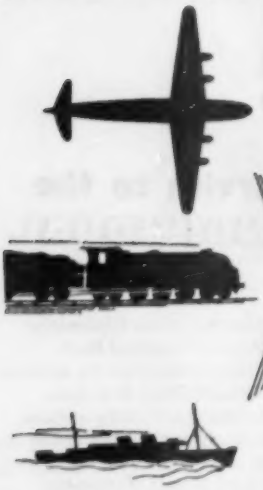

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ROYAL SCOTTISH GEOGRAPHICAL SOCIETY

ORDINARY REVENUE AND EXPENDITURE ACCOUNT Year to 30th April 1955

REVENUE

Year to 30th April 1954.				
	Subscriptions :—			
£3,147	Ordinary		£3,067 5 6	
249	Schools Corporate		186 0 0	
72	Junior Members		35 0 0	
£3,468			£3,288 5 6	
	Life Membership Fees :—			
116	Portion applicable to Revenue		120 6 0	
275	Government Grant		275 0 0	
2	General Donations		1 3 3	
1,126	Dividends and Interest	£1,277 6 6		
	Less—Provision for Amortisation	100 0 0		
			1,177 6 6	
£4,987			£4,861 1 3	

EXPENDITURE

Year to 30th April 1954.					
	Magazine—Expenses of Publications :—				
£679	Printing				£733 5 7
160	Editor				201 13 4
119	Illustrations				178 17 5
57	Wrappers, Index and Miscellaneous				147 11 5
64	Postages				89 9 6
£1,059					£1,370 17 3
£246	*Less :* Current Magazines sold		£230 0 9		
91	Advertisements		123 0 0		
100	Grant from Carnegie Trust towards expenses of publishing Magazine for 1954-55		107 10 0		
£437					460 10 9
£622					£910 6 6
	Rooms—Upkeep of :—				
£223	Rent, Rates and Insurance		£221 10 0		
72	Cleaning and Repairs		123 2 7		
72	Heating and Lighting		83 1 7		
141	Equipment and Furnishings (including Map Cases, £80 and new Lantern and Screen, £93)		202 6 0		
£507			£630 0 2		
	Less—Donations	£51 15 0			
	Exceptional Expenditure transferred from Provision for same in Reserves	175 0 0			
113			226 15 0		
£394					403 5 2
£2,493	Lectures		£1,760 18 10		
1,376	*Less*—Received for Tickets sold		279 18 3		
£1,117					1,481 0 7
1,204	Salaries				1,266 18 0
16	Auditor's Fee				15 15 0
214	Library—Books, Maps and Furnishings				126 18 5
165	General Printing				189 4 5
157	Stationery				121 7 7
41	Telephone and Telegraphic Address				55 1 6
46	Addressograph				28 8 8
21	Medals				25 11 6
32	Donations				—
142	Postages				110 13 5
111	Miscellaneous				216 4 6
600	Provision for Current and Deferred Expenditure				—
£4,882					£4,930 9 3
104 (Surplus)	Deficit for Year				65 8 0
£4,986					£4,861 1 3

BALANCE SHEET as at 30th April 1955

ASSETS

As at 30th April 1954.				
	I. Investments :—			
	£7,744, 9s. 2d. 4% Consolidated Loan (1957 or after)		£7,807 14 5	
	£5,500 3½% Conversion Loan (1961 or after)		5,772 13 6	
	£890 2½% Guaranteed Land Stock		500 13 6	
	£5,603, 10s. 11d. 3% Savings Bonds 1960-70		5,522 13 6	
	£4,106, 3s. 3d. 3% Savings Bonds 1965-75		4,173 17 4	
	£9,000 British Electricity 3% Guaranteed Stock 1968-73		8,944 7 0	
	£4,000 British Transport 3% Guaranteed Stock 1978-88		3,783 12 0	
	£2,113, 18s. 8d. British Gas 3% Guaranteed Stock 1990-95		2,119 12 4	
	£50 Commercial Union Assurance Co. Ltd. Ordinary Stock		513 7 0	
	200 Shares Guardian Assurance Co. Ltd., Ordinary		753 3 10	
	£70 Royal Insurance Co. Ltd. Do.		796 10 2	
	£400 General Investors and Trustees Ltd., Ordinary Stock		991 14 0	
	£1,000 Third Scottish National Trust Co. Ltd., 5% Cum. Pref. Stock		981 4 8	
£35,009			£36,060 13 3	
324	*Less*—Provision for Amortisation to date		460 19 1	
£34,685	(Market Value as at 30th April 1955, £33,321) (1954, £33,374)		£35,599 14 2	
5	II Sundry Debtors		75 0 0	
	III. Cash in Bank and on Hand :—			
	On Deposit Receipt	£250 0 0		
	On Current Account	424 12 0		
	On Petty Cash	15 0 0		
1,820			689 12 0	
£36,510			£36,364 6 2	

LIABILITIES

As at 30th April 1954				
£11	I. Prepaid Subscriptions			£13 11 9
	II. Reserves, etc. :—			
	Glasgow Equipment Fund Balance at 30/4/54	£60 4 0		
	Provision for Current and Deferred Expenditure for Books, Maps, etc., as at 30/4/54	2,973 12 4		
		£3,033 16 4		
	Add—Early Magazine Sales	21 11 9		
		£3,055 8 1		
	Less—Transfer to Rooms Account to meet cost of Exceptional Expenditure	175 0 0		
3,034			2,880 8 1	
	III. Funds of the Society :—			
	(a) Life Membership Fund :—			
	Balance at 30th April 1954	£2,212 0 9		
	Sums received during year to 30th April 1955	193 17 6		
		£2,405 18 3		
	Less—Sum transferred to Revenue Account	120 6 0		
2,212		£2,285 12 3		
1,001	(b) Dr. J. G. Bartholomew Fund	1,000 13 6		
608	(c) J. E. Touche Bequest	608 1 4		
27,738	(d) Ralph Richardson Bequest	27,738 11 7		
	(e) General Funds :—			
	Balance at 30th April 1954	£1,905 25 8		
	Less—Deficit for year	68 8 0		
1,906		1,837 7 8		
			33,470 6 4	
£36,510			£36,364 6 2	

LIVINGSTONE MEDAL FUND

Funds as at 30th April 1954	£1,856 4 5	Funds as at 30th April 1955	£1,865 8 0
Income Received—Interest on Stocks	53 3 8	Cash in Bank	43 19 1
	£1,909 7 1		£1,909 7 1

DR M. I. NEWBIGIN MEMORIAL

Funds as at 30th April 1954	£499 0 8	Funds as at 30th April 1955	£489 6 6
Income Received—Interest on Stocks	13 12 10	Cash in Bank	23 7 0
	£512 13 6		£512 13 6

Edinburgh, 12*th July* 1955.—I have examined the Accounts of the Royal Scottish Geographical Society for the year to 30th April 1955, of which the above is an Abstract, and compared them with the Vouchers and Instructions thereof, and I have found them to be correctly stated and sufficiently vouched and instructed.

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MAGAZINE

Vol. 71, No. 3 December 1955

THE UPPER MISSISSIPPI WATERWAY

GEORGE A. CUMMING

JUST a century ago the Upper Mississippi, that section of the great river from the Falls of St Anthony at Minneapolis to the mouth of the Missouri River was entering on two decades of great prosperity. The immigrants who settled in Minnesota and Northern Wisconsin came from the east and reached the river at five main points, St Louis, Rock Island, Galena (Dunleith), Dubuque, and Prairie du Chien, these being the termini of the early railways (Fig. 1). To convey these immigrants and their goods, and later the products of their farms, there plied on the Upper Mississippi a great fleet of steamboats. The story of these days is stirringly told by G. B. Merrick, a steamboat pilot, in *Old Times on the Upper Mississippi* published in 1909.

Yet we find the same author lamenting in the prelude of the volume that " The majesty and glory of the Great River have departed." By 1875 the competition of the railroads had reduced the great fleet to a shadow of its former size. To-day the cycle has turned once more. In the year 1954 the Upper Mississippi carried a greater volume of tonnage than ever in its history and this increase is likely to continue. To show the manner of its coming about is the purpose of this article.

Between St Louis and St Paul-Minneapolis there have grown up along the Upper Mississippi a series of smaller cities with considerable diversity of industry (Fig. 1). Twelve of these have populations of over 20,000. The northern group—Dubuque, Clinton, La Crosse, have important wood-working, and machinery industries ; the Tri-Cities area (Davenport, Rock Island, and Moline) has a great farm machinery industry, other engineering industries, and flour milling. South of the Tri-Cities, in Muscatine, Burlington, Keokuk, Quincy, and Hannibal there is greater diversity of industrial development, farm machinery, pearl buttons, shoes, clothing, and baskets being important products. The reason for the development of these cities has been largely the railroads. Railroad rates ' break ' at the Mississippi River in such a way as to give these cities advantages in transportation rates over centres farther west. To these advantages

have now been added the boon of cheap and dependable water transport.

The Upper Mississippi flows in a general north to south direction between the States of Minnesota, Wisconsin, Iowa, Illinois, and Missouri. The distance from Minneapolis to the mouth of the Missouri River is 658 miles ; the drainage area is about 174,500 square miles. The natural river-slope from the Falls of St Anthony to the mouth of the Missouri River averages about 0·45 foot per mile and is generally uniform except for rapids at Minneapolis (Minnesota), Le Claire (Iowa), Rock Island (Illinois) and Keokuk (Iowa). At the Falls of St Anthony the water surface drops over 73 feet in a mile and is the effective head of navigation for the time being.

From 1837 onward the Federal Government has periodically carried out schemes to improve navigation facilities on the river. Early improvements included the removal of snags, the blasting of rock edges, and the closure of sloughs to confine low-water flows to the main channel. Later, dams or lateral canals with navigation locks were constructed at the obstructing rapids, and sand-bars were removed by dredging.

In 1907 Congress adopted a project-depth of six feet from the Missouri River to Minneapolis, to be obtained by dredging and the contraction of the main channel by wing dams. It was soon apparent that a six-foot depth of channel would be inadequate to handle the potential volume of traffic that the river would have to carry. The advent of stream-lined steel barges, steel hulls for the tow-boats and diesel propulsion units, meant that larger tows were economic and practical, but to make full use of the new equipment deeper channels were required. By 1927 the Inland Waterways Corporation had extended their scheduled traffic operations, hitherto confined to the Ohio River and Lower Mississippi, to include trips on the Upper Mississippi from St Paul to St Louis.

In 1930 Congress authorised the Nine Foot Channel Project which would provide suitable widths and assured nine-foot navigation depths for the long-haul contract and common carrier service. This project formed part of the great scheme of public works carried out in the United States during the depression years of the nineteen-thirties. Funds for its prosecution came almost entirely from appropriations for the relief of unemployment, such as the N.I.R.A. Act of 1933, the P.W.A. Act of 1934, and the Emergency Act of 1932 and 1935. The original estimates were that the scheme would cost $150,000,000, and would provide direct employment for 10,000 men, for a period of five years. It was also estimated that indirect employment in mines, factories, supply firms and the like, would be provided for an additional 15,000 men for a similar period. It is almost certain that all these were under-estimates. The time of five years for the project proved completely inadequate but progress had advanced enough to permit the use of the Nine Foot Channel in 1939, although all the works were not completed until after the Second World War.

The creation of a nine-foot navigation depth at all river stages posed problems which could not be solved by any of the engineering

Fig. 1. Upper Mississippi River Nine Foot Channel Project. *Prepared by War Department, Corps of Engineers, U.S. Army.* Towns underlined are termini of early railways (see p. 129).

methods hitherto used in the Upper Mississippi and recourse had to be made to structures which had proved successful in Europe, particularly in Germany, but which were being used in the U.S.A. for the first time. The special difficulties of the Upper Mississippi are the running ice at the spring break-up, the high flood conditions liable to occur in April, May, or June, and the low-water condition of late summer.

The twenty-six locks and dams erected under the project have divided the river into a series of pools in which the minimum channel-depth is nine feet. The locks act as steps by which vessels are raised or lowered through the distance of 324 feet in the 650 miles of river while the pools remain practically level. The pools average 25·8 miles in length, the lifts of the locks vary from 5·5 feet to 38·2 feet (see Fig. 1).

Two pre-existing dams, the power dam at Keokuk (Iowa) and the power dam at St Paul (Minnesota) have been incorporated into the project and are the only dams used for the generation of commercial power. Each new dam embodies the following parts : a lock, 600 feet long by 110 feet wide, through which boats are lowered or raised to the pools down and upstream : a section containing moveable gates : and a section obstructed by an earth-filled dike, paved with stone and built to such a height as to be above flood waters. In addition, a number have a spillway section at pool elevation over which any flood waters in excess of that passing through the gates can flow.

The novel features of these dams so far as the U.S.A. is concerned, are the moveable gates. These may be lifted above the high-water plane during flood periods so as to remove any obstruction to the flow of water, and further are capable of being operated during periods of low winter temperatures to provide wide openings for the passage of ice. In most cases a combination of roller-type gates and tainter gates, best adapted to these natural conditions, is used.

Roller gates consist of large, steel cylinders which roll up and down in inclined tracks recessed in the sides of the piers. A permanent hoist is provided for each gate. Roller gates had been used in dams in Europe but were an innovation in the navigation projects of the U.S.A. Tainter gates consist of water-tight segments of a cylinder supported by stiffeners and girders from which two or more radial struts converge downstream to horizontal pins that are anchored in the piers. In the earlier dams enough roller gates were provided to pass the ice, which function they performed better than the shorter and less expensive tainter gates, but in the later dams the tainter gates were modified so that they could be submerged and pass water and ice over the top or be raised to pass water under the bottom. This proved to be an entirely satisafactory improvement.

The twenty-six dams show a surprising variety of combinations due to the varying problems of each site. A description of Dam 15, situated at Rock Island, Illinois, will suffice for the purpose of this article. This dam is one of the most important structures in the whole scheme in that it raises the low-water level over the stretch of water known as ' Rock Island Rapids ' hitherto the most hazardous section of the Upper Mississippi to navigate.

This is one of the historic sites of the Upper Mississippi. Nearby was the village of Black Hawk and the Fox Indians overlooking the confluence of the Rock River with the Mississippi. A mile or two upstream a large island, Arsenal Island, divides the river into a wider, western channel and a narrower, eastern one. The first bridge across the Mississippi was built here in 1854 and near the site of the original bridge a massive modern structure with a swing span, the Government

Bridge, carries the main line of the Chicago, Rock Island and Pacific Railroad. Round this site has grown up a flourishing conurbation—known over a wide area as the Tri-Cities, consisting of Rock Island and Moline on the Illinois shore, and Davenport on the Iowa shore. Recent expansion has brought further communities such as East Moline, Illinois and Bettendorf (Iowa) into the built-up area and the population of the conurbation is now over 200,000.

Dam 15 presented difficulties of site which the engineers overcame with great skill. The site is near the downstream tip of Arsenal Island immediately below the Government Bridge. The locks are so situated as to be under the swing span of the bridge without however interfering with its clearance. The dam, exceptional in that it is made up entirely of roller gates, has been built on a diagonal line pointing downstream at an angle of about 16½° from the south abutment of the Government Bridge. From the Iowa side extends the moveable section of the dam consisting of eleven roller gates each 109 feet long. The gates at each end, called skimmer gates, are smaller, in order to permit an overflow to keep the upper pool clear of debris. On the Illinois (island) side are two parallel locks, one 600 feet and the other 360 feet in length, and both 110 feet in width. The guide walls of the locks extend a considerable distance upstream and downstream. While the dam is downstream from Government Bridge, the lock chambers are upstream, and the swing span of the bridge is mounted on the intermediate wall of the locks a short distance from the lock gates. Some of the other dams visited had only one lock but provision had been made for construction of a second lock at some future date when warranted by the volume of traffic.

In the U.S.A. general supervision of river improvement under Congressional appropriation is directed by the Secretary of the Army and the Chief of Engineers, U.S. Army. For immediate supervision of the work and control of the project the Upper Mississippi is divided into three districts in direct charge of a District Engineer who is an officer of the Corps of Engineers, U.S. Army. The districts are (1) Ohio River to Saverton (Missouri), 301·2 miles, with headquarters at St Louis (Missouri); (2) Saverton (Missouri) to Guttenberg (Iowa), 313·9 miles, headquarters at Rock Island (Illinois); and (3) Guttenberg (Iowa) to source, 751·1 miles, headquarters at St Paul (Minnesota). The engineers of each district in addition to river improvement are charged, among other things, with flood control, investigations as authorised by the Congress, maintenance of channel depths, salvage operations, and general control of navigation.

The permanent raising of the water level in the pools involved many changes besides the construction of the dams and locks. Much bottom land and many of the river islands became submerged by the higher river level and from such areas all standing timber had to be cut and removed. Burlington Island, just below Burlington (Iowa) was one of the largest river islands, being over seven miles in length; since the raising of the Keokuk Pool by private power interests, it is now broken up into over seventy-five small islets with a total shore line of over 150 miles. Where it was desired to protect bottom land, levees were

built[1] and levee and drainage districts established. Municipal barge terminals have been constructed at a number of cities. In addition many riverside factories, cement works, oil plants, etc., have developed their own docking facilities.

The completion of the Nine Foot Channel Project at once made the Upper Mississippi an important link in the inland waterways of the U.S.A. These now have a total channel-length of 28,383 miles of which 23,147 miles have been improved by either State or Federal Government. Water connection with the Great Lakes at Chicago is available from Grafton (Illinois) by the Illinois River, Illinois Waterway (Des Plaines River), Chicago Sanitary and Ship Canal, and the Chicago River. The integration of the Upper Mississippi River with the inland waterways and with the Intra-Coastal Waterways makes possible the economical shipment of bulk commodities to practically any port of the United States from the ports of the Great Plains area. From the start the project was an assured success although in the early years, war-time conditions prevented a full assessment of its value.

Upper Mississippi River Tonnage : Minneapolis to Missouri River

Year	Tons	Ton-Miles (millions)
1935	1,543,995	162·9
1936	2,320,741	154·1
1937	2,262,169	207·0
1938	2,598,988	458·6
1939	2,411,151	536·5
1940	3,495,028	832·6
1941	4,501,144	1,064·7
1942	4,248,101	1,054·7
1943	3,442,288	858·0
1944	4,844,933	979·5
1945	4,587,406	1,014·9
1946	5,247,741	1,604·0
1947	6,545,169	1,583·9
1948	8,648,980	1,691·1
1949	8,383,089	1,854·1
1950	11,025,130	2,220·5
1951	11,949,839	2,185·8
1952	12,855,945	2,053·4
1953	14,741,315	2,636·8
1954	No data available	—

This Table reveals that the figures for 1940, the first year of complete operation of the project, show a substantial increase on any previous years. The war-time figures, while showing an increase, reflect, especially in 1943, the diversion of the major petroleum transporters to the Intra-Coastal Waterways and to the Ohio River system, caused by the sinkings of oil tankers off the south-east coast of the U.S.A. In these years, however, 1,980 war vessels were passed through the lowest lock at Alton (Missouri) on their way from inland shipyards to duty at sea. In 1946, the first complete season free from the effects of war, commercial tonnage increased by 660,000 tons to a new record. Since

then the increase has been continuous and now the river is carrying approximately five times the volume of pre-war tonnage.

The Commercial Tonnage Report for 1954, for the Rock Island District, furnishes much interesting material about that stretch of the river. When Congress authorised the Project in 1930 the total traffic in the Rock Island District amounted to 527,487 tons ; in 1954, the provisional figure was 7,030,010 tons—a figure approximately 1,000,000 tons above the previous record set in the navigation season of 1953. The previous monthly tonnage record was set in August 1953 with 782,852 tons of cargo. Monthly tonnage in each of the six months from May to October during the 1954 season exceeded the August 1953 record. The October figures of 980,840 tons are far above the record of the previous year.

The 1954 season also saw new records set up in the size of tow. In 1953 the tow boat *Ohio* towing sixteen barges of coal and petroleum products set a record up-bound tow of 21,500 net tons for the reach downstream of Keokuk. In June 1954, the *Ohio* improved on this record by towing sixteen barges with 23,000 net tons over the river reach from Hannibal to Rock Island, while the *Tennessee* set the record for the Rock Island-Guttenberg stretch with fifteen barges totalling 21,500 tons. In December 1954, the *E.T. Weir* established a new record for downward tows of 16,900 tons. The tow consisted of fifteen barges, 13,000 tons of grain in ten barges, 3,900 tons of scrap iron and steel in three barges and two empty coal barges.

The river traffic which was killed by the competition of the railroads three-quarters of a century ago has once more returned to play an important role in the development of the U.S.A. Designed to augment not to supersede existing transportation facilities, the Nine Foot Channel has become a most important adjunct to the vast transportation system of the United States. Gone are the steamboats and the colourful life of the river which accompanied them. Instead there are the much more prosaic deisel-propelled towboats each with its string of barges but each capable of as much work as six steamboats. Instead of passengers the cargoes are now the bulk commodities of the countryside, some pulled for long distances—sulphur and molasses from Louisiana, steel from Pittsburg, wheat and oats from Minnesota.

The main part of the upstream traffic is the movement of such basic commodities as petroleum products, coal, sulphur, sugar, and fertilisers. Grain (corn, wheat and oats), and sand and gravel, are the principal downstream cargoes, while a miscellaneous list of items, iron and steel products, aluminium and manufactured goods are transported either upstream or downstream. Of first importance is the traffic in petroleum products ; in 1935 it represented 30 per cent of the total traffic, in the post-war years a fairly steady 60 per cent. The coal traffic has varied from 10 per cent in 1940, to 26 per cent in 1946, but has since shown a decline to 11 per cent in 1952, possibly reflecting the changing position of coal and petroleum products in the economic life of the country. The upstream tonnage, due to the predominance of petroleum products and coal, far exceeds that moving downstream, the comparable figures for 1952 being 8,817,865 net tons moved upstream,

and a total downstream tonnage of 4,038,080 net tons. The greater movement of manufactured goods—finished steel-mill products, metal manufactures, aircraft parts, etc., is downstream.

The success of the Upper Mississippi Project emphasises once more the economic advantages conferred by cheap water-transport, and is an emphatic vindication of the wisdom of the measures taken by the Government of the U.S.A. for the relief of unemployment during the depression years of the nineteen-thirties.

[1] Levees were built prior to the Nine Foot Project. No levees were built as a result of the pools, except in the Keokuk pool which was built by private power interests.

NOTE.—For most of the statistical and illustrative material used in this article I am indebted to the Corps of Engineers, Rock Island District. To the Officers of that district I am also appreciative of their kindness in allowing me to visit several of the dams, and locks and to accompany a river inspection trip.

GEORGE ALEXANDER CUMMING

1901-1955

WE regret to announce the death at St Andrews on the 30th of September, 1955, of Dr George A. Cumming, head of the Department of Geography at United College, after an illness of some six months. He is survived by his wife and four children, to whom we extend our sympathies. The above article was completed by him before his death but unfortunately he did not see the proofs.—Ed.

A NATIVE of Elie, George Alexander Cumming came as a student to the University of St Andrews from Waid Academy. From that time, his connection with his university was broken only during the period from 1928 to 1931, when he held a Commonwealth Foundation Fellowship in the California Institute of Technology and, on his return to Scotland, was for one session an Assistant in Geology in the University of Aberdeen.

His long, faithful service to his university lay in the field of Geology until 1935 and subsequently he was closely associated with the development of geographical teaching and study. Graduating in Science in 1923, with First Class Honours in Geology, he was immediately appointed to an Assistantship in Geology in University College, Dundee. His early research was recognised by the award of the Degree of Doctor of Philosophy in 1927 for a thesis on 'The Lower Limestones and Associated Volcanic Rocks of a Section of the Fifeshire Coast.' He renewed his connection with St Andrews when he left Aberdeen to become a Carnegie Research Fellow in Geology.

The year 1935 marks an important change in his academic life.

General classes in Geography were instituted in United College and in University College, under the aegis of Professor Innes and members of the staff of the Department of Geology. At this time he was appointed Assistant in Geology and Geography and soon, in 1937, succeeded Dr Walker as Lecturer in these subjects and as Head of the Department of Geography, with teaching responsibilities in both Colleges. When Special classes in Geography commenced in 1946, he became Head of the Department of Geography in United College. He saw, in 1948, further development in the teaching of Geography with the institution of Honours classes in his college and subsequently, in 1953, was appointed to a Senior Lectureship. His election as a Fellow of the Royal Society of Edinburgh was further recognition of his work.

Apart from his consistent efforts to further the advancement of his adopted discipline, geographers will remember his wide and deep interests in his own countryside, interests developed in the manner of a true naturalist. His skill as a fisherman and his experiments in the field of water-divining fitted into the fuller pattern of his life.

S. J. J.

I recall very vividly my first meeting with George Cumming some twenty years ago. It was in the University to which he devoted himself so happily and with so much enthusiasm. Within almost minutes of our meeting, I was being introduced to the technique of water-divining in corridors and on the quad. This proved to be wholly in character, for George—as a cross section of the population of St Andrews seemed to know him—was a man of delightful enthusiasms and with interests which were wide and practical. Precious stones and stamps could be discussed with equal facility. A first class man in the field, he had an intimacy of knowledge of the geology and geography of the immediate region. It was this countryside which gave him those much appreciated opportunities for golf and fishing, and many must have found pleasure and profit in being in his company on such occasions. As a fisherman, he was no mean performer. It is comforting to think that in an all too brief life he was able to apply his angling skill as well as that of geologist and geographer in contrasting conditions on the other side of the Atlantic Ocean.

George Cumming was essentially a straightforward and, in the best sense of the word, simple man. It followed that he was most moved to anger by anything that seemed to be of an underhand nature and to criticism when unnecessary complexity was created. He had the great gift of friendship and that can only follow from high personal qualities. On occasions George had to bear more burdens than many of us and there were difficulties and disappointments to face, but his courage never faltered and he must have found real comfort in the happiness and naturalness of his home and family life.

G.H.J.D.

PORTUGUESE RELATIONS WITH DAVID LIVINGSTONE

T. Price

The wide response to a recent publication of extracts from David Livingstone's writings has revealed that lively interest in the explorer still persists ; but in the popular view in this country the drama has only two protagonists, Livingstone and the great unknown dark continent. It is a misleadingly simplified view. Nobody can read his books without realising that he was for considerable periods traversing country already occupied by Portuguese subjects. He came to express uncomplimentary opinions about them as a people, which have become part of our accepted background when we consider his work. But they, from their side, were looking at him and his activities, and their point of view must be taken into account in any true assessment. If only to know fully the conditions in which he worked, we must take account of every source of information and comment. One who ranks as he does among the world's great men has no need of spot-lighting.

It is often overlooked that this first references to the Portuguese are kindly and at times admiring. On his first journey, from the upper Zambezi to Loanda, he was rescued from a very tight corner by " Cypriano de Abreu, a young half-caste sergeant of militia " who brought him to safety in the territory of the Bangala " who are subjects of the Portuguese." It was three days later that they reached Cassange, " the farthest inland station of the Portuguese in western Africa," about three hundred miles from the coast. The gentlemen with whom he dined at the commandant's table sympathised with his hearty appetite " from all having travelled extensively themselves." [1] It is a picture quite different from that of the contemporary West Coast settlement outside the Portuguese sphere, when European traders sat waiting for what their negro agents or friends might bring down from the interior, hoping but scarcely expecting to see home again, without authority or responsibility in the country.

On the way to Loanda he notes that " the Basongo are very civil, as indeed all the tribes were who had been conquered by the Portuguese " ; [2] and " nowhere else in Africa is there so much goodwill between Europeans and natives as here." [3] Nine months later he emerged from the interior into the Portuguese settlements of Zambezia, having already spent six weeks in making his way through country from which Portuguese rule had only in the last half-century been driven back. He " was most kindly received by Commandant Tito Augusto d'Araujo Sicard, who did everything in his power to restore me from my emaciated condition." [4] His later notes on the Zambezian Portuguese are less complimentary, though he never ceased to record the courtesy and kindness of individuals whom he met. But in view of his later criticism of the lack of enterprise of Portuguese officials, and his assertions of native unwillingness to be counted subject to them, it is to be noted that at this stage he criticised them chiefly for their failure to open the Zambezi to free trade by disciplining the toll-levying chiefs,

since the tribes begged the attendance of Portuguese military detachments at the formal interment of old chiefs, and their successors sought Portuguese approval and support. These facts, he felt, implied authority along the river sufficient to serve his immediate purpose, and he was aggrieved that those who possessed it did not use it as he thought they should.[5]

That purpose was to make the Makololo tribe, recently settled on the upper Zambezi, strong enough to be a stable centre for civilising work among all the people of the interior. The final purpose was above criticism. The particular means that Livingstone proposed to employ were not. The Makololo, for instance, were not the obviously appointed leaders of Africa that he thought them. They were a marauding horde of fugitives and captives whose leader, Sebitwane, had brought them from the Basutoland hills through Bechuanaland, where he had for a time halted among Livingstone's friends the Bakwena. After settling on the Zambezi, Sebitwane asked for a visit from the doctor, who transferred to the tribe his trust in its chief; but few others were able to report much good of them.[6] The missionaries who followed Livingstone to establish a station among the Makololo had a chilly welcome and a tragic stay among them, and the survivors shortly abandoned the enterprise. The Barotse chiefs, displaced by Sebitwane, found after his death that internal dissensions offered them opportunity to raise their former subjects against the Makololo headmen, whom they killed off or drove out. But to Livingstone these Barotse were "degraded Zambezians," and the Makololo empire was the proper and desirable polity for interior Africa. He saw no reason to doubt its stability.

To the Portuguese, on the other hand, the interior was not a free field in which adventurers, black or white, might build new empires and expect to be left in peace. They had in 1630 struck a treaty with the Monomotapa of that day, Emperor of the Kalanga people, who accepted their suzerainty for his vassals and successors.[7, 8] In their heyday they had never penetrated to the limits of Monomotapa's empire, and in the latter part of the eighteenth century he, like themselves, had fallen on evil days under the assault of Rozwi invaders from the north, who in turn had been shattered by invasion from the south of Ngoni fugitives, driven from home, like the Makololo, by the Zulu wars. These were mere usurpations and tumults, however, and did not affect Portuguese claims to rule all that had been Monomotapa's, when their resources might enable them to assert their claims effectively. When Livingstone appeared among them he did so in the character of the commercial envoy of Sebitwane.[9] It is doubtful whether they had heard of that chief before. They certainly did not regard him as the natural potentate of the interior. He was simply the latest of a succession of turbulent adventurers whom they were compelled to tolerate on their borders; and meanwhile they had no objection to carrying on trade with the people he for the time being controlled.

It was a different matter to permit a member of another imperial European nation to claim the right to trade with those intruders into the Portuguese sphere, uncontrolled by the Portuguese administration.

This was the claim which Livingstone made on his second journey, when he appeared among them in the character of Her Majesty's Consul at Quilimane for the Eastern Coast and the independent districts of the interior.[10] He had given up work in a mission station to undertake the opening up of Africa to commerce and Christianity—the first certainly as handmaid to the second ; but he was too unduly insistent on free trade to be popular with an impoverished colonial administration.

Meanwhile he had published an account of his first journeys when he travelled as protégé of the Makololo chiefs. In it he spoke of Sebitwane " unwittingly performing a good service to the country by breaking down the old system which prevented trade from penetrating into the great central valley." Livingstone simply says " Sebitwane made a rapid descent on the Batoka on the islands in the Zambezi, and swept them out of their fastnesses." [11] The account given later by the neighbouring Ila tribe is that the Batoka chiefs were invited to a joint council, " and while they sat unarmed Sebitwane's warriors massacred them." [12] His free trade enthusiasm would scarcely commend itself to those who knew that story. He had also proclaimed his conviction that " it is on the Anglo-American race that the hopes of the world for liberty and progress rest," and had offered the interior to " the Church —Wesleyan, Baptist, and that most energetic body, the Free Church " [13] of Scotland. It was a racial and religious selection that could scarcely be welcome to Latins and Roman Catholics.

In reprobating Boer incursions among his Bechuana friends, he observed that if trade had been open by which they could have acquired guns " the Boers would never have attacked them." [14] Possibly not, but experience indicated that the Bechuana would have looked for somebody else to attack. The Portuguese, looking out on a troubled frontier and noting the kind of native friends that the explorer had, may be pardoned for requiring control of trade. It is at this point that Livingstone's references to them become bitter. He denies their imperial authority, because they pay tribute to Landeen (Gaza-Nguni) marauders from the south ; and he argued that this was a reason for refusing them the authority in the interior that he claimed for his own nation. He accused them of deliberately encouraging and persevering in the slave trade, and of excluding him from as much of the interior as they could in order to conceal their misdeeds. He later expressed concern that his pioneering journeys had simply made things easier for the Portuguese slavers to penetrate to new untapped and defenceless tribes.[15] In all these accusations there was an element of truth but there were other equally true elements which he did not mention.

No Portuguese denies that he saw their African empire at a very low point. But that was the natural outcome of recent history. Portugal had been an occupied country during the Napoleonic wars, had contributed materially to inflicting the Peninsular reverses on the French, and had gained, not freedom but a British military dictator, Marshal Beresford whom they had to expel by force of arms in 1820. Britain had also helped to make Brazil independent, so removing a great part of the Portuguese imperial revenue. The country had for the time

being neither men nor money to expend on her colonies. Britain, on the other hand, had done pretty well out of the wars and her industrial development in the only uninvaded country.

She had found it desirable and possible to abolish slavery in the territories under her control, disarming colonial discontent by granting the deprived masters twenty million pounds of compensation. Portugal likewise proclaimed the illegality of the slave trade, but lacking funds could not buy the freedom of existing slaves. She did, however, give up the colonial revenue from export duty on slaves shipped from the coast ports and, lacking that revenue, had to retrench her colonial services. The deprived officials, for the most part locally recruited, were out of the main current of European idealism, and saw no reason why they should not restore their fortunes by the slave-trading which was now more profitable than when it was legal. The governors lacked equipment for the few honest men they had for the preventive services ; and their faith in the humanitarian zeal of the great powers received a shock over the affair of the barque *Charles et George*. The French sugar plantations on Bourbon Island maintained a steady demand for labour, at first frankly that of slaves. Napoleon III forbade the purchase of slaves, but permitted the planters to recruit *engagés*, indentured labourers or what were called in the contemporary South Seas ' blackbirds,' on the mainland. Livingstone saw gangs of these volunteer labourers in chains, going out for shipment, and called them slaves, as they were.[16] But when the Portuguese coastguard found the barque waiting for cargo where she had no business to be, and where it was obvious what she expected to ship, the French government responded to her arrest with an ultimatum and the despatch of a warship. Britain advised her ancient ally Portugal to drop the case, and the slave catchers were reassured of their market.[17]

Livingstone flatly accused the Governor-general of conniving at slave-trading by, among others, his brother the Governor of Tete. Almeida refuted the accusation as soon as it reached him, adding that it would have been fitting to inform him of it before it was published, and that Livingstone as Consul had not seen fit to pay even an official courtesy call.[18] The naval officers of the British anti-slavery squadron on the coast, who did know the Governor-general personally, had a good opinion of him.[19] On the whole it appears that indignation at some of the brutalities that he had discovered up-country combined with resentment that Portuguese administration had power to interfere with his plans for the interior had rendered him injudicious.

Coming into Africa at first by the Cape, he took the Cape view that the interior was theirs. The trek-Boers expected to extend their settlements to the Nile. The farmers of Nylstroom in the Transvaal thought they had in fact done so. Nobody in the Cape thought that there were any claims to be considered up-country except those of the Kaffirs, and to Livingstone the Kaffirs were his friends the Makololo. The Boers threatened the old way in from the Cape, and one could never be sure when British political strategy would give the Boers a free hand to cut the communication of friends of the Kaffirs. When he found that his scheme to outflank the Boers simply brought him into

Portuguese spheres, Livingstone fell back on denying their moral and political rights to control the country. His biographer records that when the British government was requesting Portuguese approval and assistance for his second expedition, " friends who understood more of diplomacy than he did " wrote notes warning him to expect little help and, in one instance, " expressing the conviction that the sooner those Portuguese dogs-in-the-manger were eaten up, body and bones, by the Zulu Caffres, the better."[20]

It is a comment which lends credibility to a passage in the standard history of Mozambique by General Teixeira Botelho. He says : " Some of the inroads, carrying extermination and rapine, which resulted from Chaka's (Zulu) wars, entered the theatre of our western territories in modern Rhodesia and the governors-general incessantly deplored these to the home authorities, adding that these savages were excited against us by the English for their own obscure ends." [21] It is not necessary to seek for double-dealing at the Foreign Office ; Governor Almeida wrote to Lisbon in December 1862, on the subject of Livingstone's second journey : " In view of the invasive tendencies which nobody can fail to note in the nation and race to which he belongs, and in view of the diverse pretexts of which they take advantage in different parts of the world . . . the scientific expendition of Dr Livingstone must keep us on the alert. We are a small nation, with no means of resisting violence, and therefore must be careful about making concessions." [22] Livingstone was both friendly with an aggressive and unsettled tribe, and a scout for new European settlements which would certainly not be under Portuguese control. These, rather than the scientific interests which were possibly equally, certainly no more, prominent in the explorer's mind, were the matters which concerned a responsible governor and sufficiently explain what Livingstone felt to be official obstructiveness. The Portuguese had no objection to anyone exploring the interior ; they had strong objections to conceding political inches that would encourage rival imperialists to take ells.

Behind these official reservations at high level, there was the attitude of the Portuguese colonist settled in the interior. Many of them were of Asiatic origin, from Macao or Goa, and most were descendants of marriages with natives. They had much of the physical appearance of the blacks, were illiterate, and often of doubtful enough loyalty to their government. They held prazos, which were practically feudal lordships, by grant originally from the Portuguese crown ; but, like feudal barons elsewhere, when the central authority was weak, they were apt to consider themselves independent and even rival powers. They lived in bush forts, commanded independent armies of serfs and foreign slaves, like the Turkish janissaries, and lived by exacting tribute ostensibly on behalf of the government. The family of da Cruz, of Masangano prazo below Tete, was for half a century in chronic conflict with the government ; and Livingstone refers to his contemporary da Cruz, known to the natives as Bonga, as a vicious character. Two others of his aversions, Belchior do Nascimento and Mariano Vaz dos Anjos, belonged to the same group, but were of purer Portuguese origin. Belchior is spoken of with approval in Portuguese

history as " the devoted," and was in fact the principal agent in ending the Masangano tyranny. Mariano is still remembered on the lower Shire River by the name of Matekenya, as a great leader and defender of the Chikunda people who now call themselves Asena. Manuel Antonio de Sousa, of Gorongoza prazo, was a loyal baron, who fought the enemies of Portugal with much success, and in fact put an end to the tribute-collecting inroads of the Landeens.

These were the Portuguese " half-caste " slavers who excited Livingstone's wrath against the whole Portuguese administration, because it could not or would not restrain them from fighting with the tribes of the interior. But they did not share his view that the tribes would gratefully relapse into peace if only they were not harried for slaves. Portuguese colonial history recorded a constant succession of barbarian terrors originating in the wandering of just such tribes as the Makololo. The most notorious was the Zimba devastation of the sixteenth century, finally crushed by a Portuguese and native alliance under the walls of Mombasa fort. The frontiersmen believed in attack as the best form of defence, and adopted the institution of slavery, traditional for both Europeans and Africans, as the only binding relationship that could exist between people of tribal culture and a handful of isolated foreign masters. The relationship had to be binding if the masters were to command fighting forces in frontier wars, and that was the function to which they were appointed. Naturally they were not inclined to listen sympathetically to a wandering newcomer, who had no stake in the country, talking against slavery in general and their practices in particular.

Nor were they inclined to accept him as an authority on the condition of the interior. Possibly they did not know the Makololo country, but they knew a good deal beyond their fortress dwellings. They knew how deadly to Europeans was the land that he hoped to settle with artisan communities—a discovery that the Scottish missions were to make again on their first dozen years in Nyasaland. They knew the instability of native settlements and the inadequacy of native application to European enterprises. They knew the poverty of the land in products worth exporting. Governor-general Almeida spoke for them as well as for himself when he added, to a report on the failure of a Portuguese projector's scheme for a peasant development settlement at modern Port Amelia, the topical observation : " Good intentions are giving birth to one deceptive scheme after another out here . . . Dr Livingstone too, having seen the Zambezi in flood, has failed to navigate it in the low periods when it lacks both use and dignity ; and driven from the Shire by its cataracts, has turned to the Rovuma " [23] . . . which as we know proved the least practicable of all. To the colonial Portuguese he was simply a peevishly opinionated tenderfoot who ran into trouble because he would not listen to advice.

On his side, he came to deny passionately that they had ever known anything worth listening to before he told them of his discoveries. In part this was strategic assertion of his own rights of discovery in order to forestall objections that an occupying power's agreement must be procured before his plans for the people of the

interior could be put in train. In part it was rejection, by one trained in exact sciences, of merely historical and qualitative knowledge, which had not even been generally published for information and verification. When the Portuguese government did respond by publishing, he was convinced that the material was bolstered up by details derived from his own discoveries.[24] In part he was denying that illiterate men of colour could be regarded as bearers of civilised authority and European inquiry. He dismissed the authentic journey of two agents of the government of Angola, who in 1815 had reached the Zambezian settlements and returned home, as irrelevant to his dispute over the limits of Portuguese rights.[25] The men had good Portuguese names, the natives of the interior referred to Livingstone and them alike as *Bazungu* —which is still the current native term for ' Europeans ' ; but they and all the other Bazungu whom he met in the interior were dark-skinned and woolly-haired, and could not produce written journals of their experiences. It was this aspect that evoked the acerbity of Professor Mendes Correa, when he told the First National Congress of Colonial Anthropology that " Livingstone, ' discovering ' lands already trodden by Portuguese, hypocritically recorded that the Portuguese whom he continually encountered were so dark (*tanto oscurido*, which carried also the sense of ' so much in the dark, so ignorant ') as to be indistinguishable from the blacks." [26] Modern opinion would agree that a man's allegiance rather than his colour or culture should determine which nation could claim credit for his enterprise.

A recent book review in the *Glasgow Herald* speaks of " the betrayal of Livingstone's ideals " in the century since his call for men to follow up his work. Britons and Belgians now have their share in the condemnation which the Doctor heaped on the Boers and Portuguese. We may profitably turn from Dr Blaikie's bitter observation that " the Portuguese " without qualification had practised " atrocious slave-trading, which not only made his labour fruitless, but used his very discoveries as channels for spreading fresh misery over Africa," [27] to Livingstone's own final tributes to the Portuguese whom he knew personally ; to the authorities at Mozambique for obliging accommodation ; to Senhor Canto e Castro, the incoming Governor-general, of whom " we believe that no better man could have been selected for the office " ; and to " Mr Soares . . . who appeared to us to have been much vilified in a publication in England a few years ago . . . we very much regret that his character was so grievously misrepresented." [28] And when we return to the Tete chapter of the *Missionary Travels* which indicates the extent of contemporary Portuguese travel, though none of it productive of accurate surveys, we can understand much of the modern Portuguese impatience with the Zambezian part of the Livingstone legend as it is popularly repeated.

General Teixeira Botelho salutes him as " the notable English discoverer " and all Portugal would agree that he showed them much that they did not know about the interior. The Portuguese deprecate the brutality of their frontiersmen much as we do that of the colonists who poisoned the aboriginal Tasmanians, or as the other branch of the Anglo-American race is beginning to realise that General

Custer provoked his last fight. They will not admit that it was their duty to humanity to abdicate at the behest of an incomer whose discoveries in human and physical nature had uniformly unfortunate immediate practical consequences—the collapse of the Makololo and Magomero missions, the frustrations of Zambezi navigation, the conflicts and dismissals within the officially commissioned second expedition. Nor do they agree that they had no achievement to the credit of their colonies ; from settlement to settlement cut off more than a third of the distance from coast to coast. Livingstone's traverse was a magnificent achievement. He might have been able to do it independently of the Portuguese colonists ; but the historic fact is that he did not. Possibly the time has come to re-assess some of our familiar conceptions, and to allow that they are less than just to a people who were open to criticism because they were trying to do what only a handful among ourselves were just beginning to plan.

[1] LIVINGSTONE, D. *Missionary Travels in South Africa.* London: 1857, pp. 265-70.

[2] *Op. cit.*, p. 378. [3] *Op. cit.*, p. 372. [4] *Op. cit.*, p. 628.

[5] *Op. cit.*, pp. 642-3. [6] *Op. cit.*, pp. 84-9, 92.

[7] TEIXEIRA Botelho, Gen. J. J. *Historia dos Portugueses em Mozambique.* Lisbon: 1936.

[8] KELTIE, J. S. *The Partition of Africa.* London : 1893, pp. 54-5.

[9] LIVINGSTONE, D. *Op. cit.*, p. 228 and p. 397.

[10] BLAIKIE, W. G. *Life of David Livingstone.* London : 6th Edition, 1911, p. 190.

[11] LIVINGSTONE, D. *Op. cit.*, p. 88.

[12] SMITH, E. W., and DALE, A. *The Ila-Speaking Peoples of Northern Rhodesia.* London : 1920, I(1), p. 28.

[13] LIVINGSTONE, D. *Op. cit.*, pp. 676, 679. [14] *Op. cit.*, p. 675.

[15] LIVINGSTONE, D. *Narrative of an Expedition to the Zambezi.* London : 1865. Postscript to the Preface.

[16] *Op. cit.*, 1865, p. 594.

[17] TEIXEIRA BOTELHO, Gen. J. J. *Op. cit.*, II, p. 168.

[18] Archives of Colonial History, Lisbon : Mozambique Papers, 1862. No. 266.

[19] LIVINGSTONE, D. *Op cit.*, 15, 1865, p. 420.

[20] BLAIKIE, W. G. *Op. cit.*, p. 195.

[21] TEIXEIRA BOTELHO, Gen. J. J., *Op. cit.*, II, p. 326.

[22] Archives of Colonial History, Lisbon : Mozambique Papers, 1862. No. 266.

[23] Archives of Colonial History, Lisbon : Mozambique Papers, 1862. No. 41.

[24] LIVINGSTONE, D. *Op. cit.*, 15, 1865, p. 460.

[25] BLAIKIE, W. G. *Op. cit.*, pp. 161, 237, 372.

[26] First National Congress of Colonial Anthropology. Report of Congress. Discurso Inaugural. Oporto : 1934.

[27] BLAIKIE, W. G. *Op. cit.*, p. 284.

[28] LIVINGSTONE, D. *Op. cit.*, 15, p. 581.

COMMENT

The late Rev. Dr James I. MacNair, writes of Mr Price's article as follows :—

EDINBURGH,
28th April 1955.

" My doubt . . . is . . . as to the wisdom of waking up a controversy that ran hot and strong ninety years ago but is, I should think, forgotten now. Naturally the Portuguese, being a proud people, may be sensitive on the subject, but, even in Mr Price's showing, they have in the incident nothing to be proud of. They do not love Livingstone. That is natural in the circumstances.

" The background is this : Livingstone came back from the Zambezi in 1864 boiling with indignation at what he had seen of the effects of slave traffic in that part of Africa. He had seen adequate reason to believe that many of the Portuguese officials promoted the horrible traffic and that the Government did nothing to stop it. Indeed, he believed that slavery was the basis of their colonial methods.

" He was sore at the non-success (as at the time it appeared) of the Zambezi Expedition and he felt it his main duty to express the cruelty of which he had seen so much. So, at the meeting of the British Association in Bath (1864), he stated his case against Portugal without compromise. Livingstone, in controversy, like a good Highlandman, used the claymore not the rapier.

" Naturally the Portuguese authorities resented the attack keenly—all the more because in his first book (*Missionary Travels*) Livingstone had, in general, spoken favourably of the Portuguese people and their methods. He had up till then seen little of the cruelty of slavery. He had received much kindness from many of their people and believed implicitly that all the good men among them were as sick of slave-owning as he was. To prove this attitude is the fact that the last thing he did, at the end of his first journey, was to write to the King of Portugal a memorandum showing that slavery was the reason for all that was wrong with the colony.

" What he saw on the Second Expedition (that to the Zambezi) completely changed his view. He saw that the Portuguese officials lived largely on the [slave] traffic—indeed, had to, he believed, because of their meagre salaries.

" Mr Price defends Portugal by admitting that at that date the colony was in a very bad way, financially and administratively, and was served by a very poor type of half-caste official—with some exceptions. That was no defence from Livingstone's point of view. He fought what he saw.

" I can't help feeling that the writer has been guilty of special pleading in some aspects to back up the Portuguese point of view . . . e.g. Livingstone's attitude regarding the Makalolo. He says Livingstone was " a protégé of the Makalolo chiefs " and that he travelled in the character of a commercial envoy of Sebitwane. That is a travesty of the position—(anyway Sebitwane had died !).

"Then on the unreliability of Portuguese maps—a sore point. Mr Price in fairness might have quoted Livingstone's warm approbation (Blackie, p. 161) of the only two Portuguese scientists, Roga and Lacerda, who had done exploration before his time. The others made no claim to accuracy.

" But I have written enough. The Portuguese, after the Livingstone contact, improved their ways, reverted, it may be said, to the much better policy of their earlier days. But Livingstone reported what he saw. He was not probably a man of level judgment always. A man of prophetic fervour rarely is—but it is to him more than anyone else, must go the credit of ending slavery—there can be no doubt. . . . Perhaps I cannot claim ' level judgement ' any more than Livingstone could in this matter ! "

JAMES I. MACNAIR.

The late Dr MacNair was Chairman of the Scottish National Memorial to David Livingstone at Blantyre, editor of a one-volume abridgement of Livingstone's Journals, and the Royal Scottish Geographical Society's Research Medallist of 1954. In view of his authoritative knowledge of the life of the great Scottish explorer and of the somewhat controversial nature of this particular aspect of Livingstone's life and work, we are proud to publish this last contribution of a distinguished scholar to his life's study.—ED.

A MUNGO PARK ANNIVERSARY

An address to the Selkirkshire Antiquarian Society, November 1955, with the Patronage of the Town Council of Selkirk

RONALD MILLER

IT is now 150 years on the nineteenth of November since Mungo Park (Pl. 1) wrote from the banks of the Niger his last letter to his wife, Allie. " . . .We have already embarked all our things, and shall sail the moment I have finished this letter. . . . You may be sure that I feel happy at turning my face towards home. We this morning have done with all intercourse with the natives ; and the sails are now hoisting for our departure for the coast." The die was cast : he had passed the point of no return. It remained only to press forward into the unknown, staking his life for an answer to the riddle of the Niger. Knowing that retreat would be impossible, he embarked on a river that might well lead him into the desert, there to shrivel and disappear, and he with it. Was this folly ?—persistence beyond reason ?—devotion to duty ?—fatalism ? Such are among the questions which Park's story has evoked for a century and a half and which will hold his memory green for as long as men admire those who stake—and lose—their lives for an idea. His friend, Sir Joseph Banks, one of the foremost scholars and patrons of science of his time, wrote of Park that he had " strength to make exertions ; constitution to endure fatigue ; temper to conciliate ; patience under insult ; courage to undertake hazardous enterprise when practicable ; and judgment to set limits to his adventure when difficulties were likely to become insurmountable." High praise indeed ; almost a definition of the perfect explorer. That Park partook of these qualities we know : that he had also weaknesses we know : the development of both in the tale of his two African journeys is one of the most fascinating in the annals of exploration.

Mungo Park was born on the farm of Foulshiels, by Yarrow Water, in 1771. The farm was small and the family large and there can be no doubt but that from his earliest days Mungo was accustomed to plain fare and hard conditions. Seventh child of a family of thirteen, he can have had no delusions of personal importance or privilege. Typically of his time, five of the thirteen children died young : Mungo was more conscious of the sharp sickle among men than we are.

From the slender resources of Foulshiels, his father contrived somehow to employ a tutor for the children and eventually Mungo went to school at Selkirk, no doubt making the four-and-a-half-mile journey on foot. He was not a distinguished scholar, though regular in both attendance and application. Rather was he remembered for his passion for Border folklore and ballads. In his hard practical way he must yet have been something of a dreamer : no doubt in his imagination he shared the mighty deeds of valour of his own folk in times past and he must have pictured himself in a field where he could emulate them and win both name and fame. But in the forefront was the prime necessity to earn a living. Lacking capital or connections, it had to be

by his own exertions, physical and mental. Mungo chose to become a doctor and to that end was apprenticed to Dr Anderson of Selkirk. At the age of seventeen he passed on to the medical course in Edinburgh University, where he is recorded as having matriculated but not as graduating. However, as the latter was regarded at the time as something of a formality we must by no means regard him as having failed. At no time, however, does he betray any enthusiasm for medicine : indeed he consistently tries to avoid practising his profession and there can be little doubt but that this contributes to his desire—or opportunity—to seek an outlet in another sphere.

Having completed his Edinburgh training, Mungo, like many another ambitious Scot, went to London to seek his fortune. There he stayed with his brother-in-law, James Dickson, an outstanding personality who had gone south as a simple gardener and ended as a distinguished botanist and collaborator with Sir Joseph Banks. It was through the latter's influence that Mungo got his first post—that of surgeon on an East Indiaman. His voyage to Sumatra and back whetted his appetite for travel and introduced him to research studies, for on his return he wrote a paper on some fishes new to science and became a Fellow of the Linnean Society which James Dickson and Sir Joseph Banks had founded. Thereafter he remained in London, looking for suitable work other than the practice of medicine.

To continue the story, we must look further afield. It was the Age of Reason : man was probing into nature's secrets along every avenue into which he could gain an entry. The words Terra Incognita were disappearing from place after place on the map of the world with the notable exception of Africa. Its north coast was known to Europeans from the earliest times ; its outline had been determined to a very reasonable degree of accuracy by marine navigators ; the interior, however, remained obstinately blank. No navigable rivers offered themselves ; on the contrary, the coast was smooth in outline, often cliffed, often low, sandy and surf-bound. Some stretches of it were backed by desert, some by great forests and some by that most impenetrable of thickets, the mangrove forest. Much of it was held by Moslems, at the time fanatically opposed to strangers, especially Christians, and elsewhere most of the indigenous tribes, through poverty and ignorance, were suspicious and often hostile. The net result was that while Cook was pressing the boundaries of the mythical Terra Australis back to the Antarctic Ice Barrier and while cartographers in Europe were surveying and mapping their continent with virtually modern precision, Africa was still a mystery.

James Bruce was the pioneer of those who went to Africa without thought of trade or personal gain but purely to explore. His journal, however, now known to contain very accurate material, especially about the Nile, was at the time regarded as quite fantastical and increased even more the demand for accurate information about the interior. In 1788 the African Association was formed, with Sir Joseph Banks as one of its leading members. It soon became preoccupied with the problem of the course of the Niger, which, it was felt, might prove a more fruitful line of approach to the interior than the Nile.

A series of experienced travellers were commissioned. One Ledyard was to cross Africa from East to West at its widest : he died at Cairo. Lucas was to cross from the Mediterranean to Guinea : he was driven back after a few hundred miles. Houghton was to penetrate from the west coast : he perished on the Timbuktu road.

It was at this distinctly inauspicious point that Park entered the field. The failure of all his predecessors seems to have in no way dismayed him : if anything it enhanced the value of the prize which he felt to be within his competence. As far as we know, he accepted without question the remarkable enunciation by the Association of the whole basis of his venture. He was to bear himself as " a traveller of good temper and conciliating manners, who has nothing with him to tempt rapacity." He was to go empty-handed into a hostile land, giving and taking no offence. This mandate cannot be sufficiently emphasised if we are to understand Park's behaviour : those who profess to be nauseated by the meekness with which he suffered insult and injury overlook the fact that Park turned the other cheek not out of lack of spirit but of policy, and was able to do so by virtue of the great strength within him which no ordinary insult or vexation could touch. On his second journey, no such restriction was laid upon him and it is not surprising that his attitude was then very different. When he dealt out hard measure, he was doubtless not unmindful of the measure that had been meted to him on his first journey. That his first mission was successful and his second a failure may give us to think.

He landed in the Gambia in 1795 on the 5th of July, in the rainy season, and sojourned there with the kindly Dr Laidley till the dry and cool weather came in December, learning the Mandingo language and as much as he could about the people and country he was to visit.

The western Sudan, into which Park's quest led him, is typical of Africa in that for the most part it consists of vast monotonous plains. The underlying rocks, as of most of Africa, are hard crystallines, such as gneisses and granites. These are mainly buried in the products of their own decomposition but occasionally greater resistance to erosion gives rise to a small steep-sided hill of virtually bare rock—the kopjes of South Africa are similar. The basement rocks, however, have been warped since ancient times into broad, very shallow, basin-forms and in these, continental sediments, mostly sandstones, have accumulated and now form extensive low plateaus with remarkable scarp edges. Such are the fabulous Mountains of Kong (Pl. 4a) of Park's account. Warping movements of the kind just mentioned, it would seem, account for the curious course of the Niger. Rising in the Fouta Jallon plateau just inland of Sierra Leone but only a couple of hundred miles from the sea, the river finds the main gradient to be to the north-east and so is led deep into the continent and towards the Sahara. Here, the evidence suggests, the river formerly lost itself in a vast down-warped sump, part of which still exists near Timbuktu particularly in the high-water season. From Timbuktu onwards, however, the river swings to the south-east and crosses an up-warped portion of the continent. Instead of being choked with sediments it now dashes

over a rocky bed with an increasing number of rapids (see Pl. 4b) until at Busa (Boussa), not far inside the modern Nigeria, it cataracts over the rocks among which Park lost his life. Downstream it becomes smooth again and from Jebba is navigable to its mouth. It is therefore appropriate that the joint monument to Park and to Lander, who completed the answer to the Niger problem by working upstream to Busa (Boussa), should be on an island in the mighty Niger stream at Jebba.

These Sudanese plains, of course, offer few obstacles to transport and Park had no great difficulty in picking his way. The climate, however, was another matter. Coming alternately under the influence of the Sahara and the sea as the sun moves to Cancer in summer and Capricorn in winter, the Western Sudan has two well-marked seasons, a rainy one from about May to October, depending on latitude, followed by drought for the rest of the year. Before the rains break, however, temperatures climb to overpowering heights and even the natives are obliged to rest in the crushing heat. Rock and sand regularly become too hot to touch. With the rains and cloudy skies, temperature falls to around 80° F. and is more supportable, but as humidity increases and flood waters spread, mosquitoes multiply and carry malaria from man to man. These rainy-season floods often block transport entirely, and, even when they cease at the end of the rains, leave a legacy of stagnant pools which are even more prolific of mosquitoes and disease.

It was on the 2nd of December then, in the most favourable season of the year, that Park set out from the Gambia with " provisions for two days ; a small assortment of beads, amber and tobacco, for the purchase of a fresh supply, as I proceeded ; a few changes of linen, and other necessary apparel, an umbrella, a pocket sextant, a magnetic compass, and a thermometer ; together with two fowling-pieces, two pairs of pistols, and some other small articles." He was on horseback, attended by two natives, one Johnson, an ex-slave who had been to Jamaica and England, and the other a slave, Demba, both mounted on asses. Park does not state how many days provisions he counted on being able to buy with his " small assortment " but clearly it could not be many : he obviously faced a prospect of a more or less rapid transition from the status of escorted cavalier to mendicant. While he thus would soon satisfy the African Association's requirement of having " nothing with him to tempt rapacity " he did not at the outset give this impression : on the contrary, the fact that he was on horseback and attended by two mounted servants (and accompanied by four other Africans) no doubt proclaimed then, as it certainly would now in West Africa, that he was a person of consequence and therefore of some wealth. On the second day out, accordingly, the exactions began— " four bars of tobacco for the king's use," this as a result of " persuasion " by a large body of natives that " it was usual for travellers . . . to make a present to the king." On the next day, again, he had to " pay customs " for the privilege of crossing the kingdom of Wooli. On the 21st he fell foul of a chief reported to have ill-treated Major Houghton, and Park attempted to placate him with gunpowder, amber, tobacco and the umbrella. The chief was not satisfied, however,

and having the upper hand forced Park to surrender his fine blue coat in addition. So the exactions proceeded ; on Christmas Day he was plundered—in the name of customs—of half of his possessions and yet in the same passage of his journal he gratefully records how an old negro woman gave him a few handfuls of groundnuts for his supper. Early in January he was again stripped of half of his goods but a few days later he writes, after witnessing the touching reunion between one of his travelling companions and his old mother, " whatever difference there is between the Negro and European in the conformation of the nose and the colour of the skin, there is none in the genuine sympathies and characteristic feelings of our common nature." Astonishingly, in view of the harsh treatment he received in Africa, Park developed no rancour against the African as such (Pl. 2). It testifies to his very big-hearted character that he consistently recognised the good as well as the bad in Africans and reminded himself that the same was true of his own folk. In this respect Livingstone resembled Park and it may well be that their similar humble origins in a poor country account for the absence in them of the arrogant assumption of superiority which later came sometimes to characterise the attitude of white men in Africa.

But while Park had been able to overcome his difficulties among negroes and had always found somewhere a response to this own humanity, the Moors, whom he encountered at the end of February, were something quite different (Pl. 3). Contemptuous of the negroes on grounds of race and inferior culture, they had not the slightest charity or respect for Park. As a Christian they classed, and indeed lodged, him with the pigs. Their chief, Ali, imprisoned Park and subjected him to every possible insult and injury. These, Park states, he " bore with an unruffled countenance " " but never did any period of my life pass away so heavily," " my distress was a matter of sport to them and they endeavoured to heighten it by every means in their power." To add to his misery, it was the hot season ; temperatures rose to overwhelming heights and dust storms were frequent : drought supervened and Park was reduced to such desperate thirst that he gladly knelt among the cattle to share their water-trough.

Deliverance came eventually, however, out of the chaos engendered by a local war in which the Moors were involved. In the confusion Park was able to slip away and set course to the east-south-east to continue his quest for the Niger. There remained to him his horse, such " a perfect Rosinante " that the Moors had not thought it worth stealing, and his pocket compass, whose remarkable behaviour frightened them (Park had explained that it always pointed towards his mother). Otherwise he was destitute, without food or the means of buying it, and faced with a trek across interminable scrub-covered plains in which little water was to be expected.

He persevered, however, sometimes riding, sometimes walking to spare his horse, but his strength gradually waned until, feeling the end had come, he unbridled the horse so that it could fend for itself and then collapsed in a faint. He recovered and found his faithful horse still by him and a rain-storm building up. With hope renewed he struggled on through the preliminary sand storm until the rain de-

scended in torrents and he was able to quench his thirst by sucking his wet clothing. For the first few days he dared not contact human settlements for fear of recapture by the Moors and therefore slept in the wilderness, risking attacks from lion and jackal. Entering more densely populated areas, he was sometimes able to join forces with negro travellers, even to share the hospitality offered them by their friends. On other occasions he trudged along barefoot, leading his worn-out horse, a figure of fun to the villagers but buoyed up by the frequent reports of the nearness of the Niger. On the 20th of July his objective was attained " I saw with infinite pleasure the great object of my mission—the long sought for majestic Niger, glittering to the morning sun, as broad as the Thames at Westminster, and flowing slowly *to the eastward.* I hastened to the brink, and, having drank of the water, lifted up my fervent thanks in prayer to the Great Ruler of all things, for having thus far crowned my endeavours with success."

So elated was he, that he attempted to follow the river downstream, but soon realised the folly of this course for what with the hostility of the local chiefs and the spreading floods of the river he was like to perish in a very short while. Retracing his steps, however, was equally difficult and he floundered across flooded country, avoiding hostile villages and begging food when he could. Robbed by highwaymen and suffering almost continually from malaria, he was indeed in a sorry plight, but just as he had reached the end of his resources he had the great good fortune to stumble on a sympathetic slave trader. This man, Karfa Taura, undertook, in return for the promise of the value of one prime slave, to lodge Park till the rainy season should end and then escort him to the Gambia with his annual convoy of slaves.

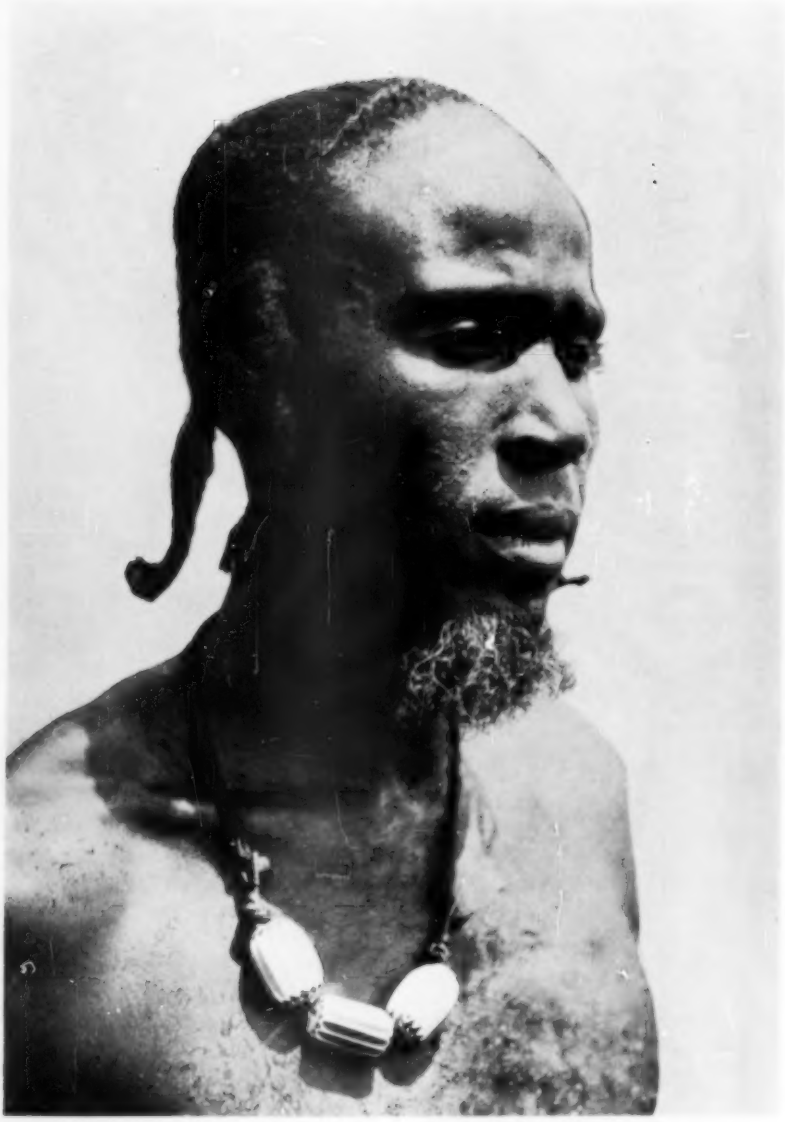
Seven peaceful months of rest with his friend Karfa restored Park's strength considerably and contacts with a fine old negro scholar who lent him—of all things—a *Book of Common Prayer* refreshed his mind enormously. There is little doubt but that this episode is responsible for Park's understanding of and affection for the negro.

After many delays in making up a convoy of slaves, traders and freemen, the party set out on the 19th of April and trekked rapidly westward, often by forced marches and not without hardship and danger en route, to reach the Gambia on the 20th of June. There Park was fortunate enough to obtain a passage on an American ship almost at once but did not however reach England till the 22nd of December, after an absence of two and a half years.

He was at once the hero of the day, not least because he had long been given up for lost. He was fêted and lionised by both scholars and society but bore all with a calm dignity and quiet manner which often disappointed those who rather expected to find a dashing hero, ready with reminiscences. His book had an instant success, backed as it was by the African Association, whose Major Rennell wrote an appendix on the additions which Park had made to the map of Africa. As his navigation, however, had mostly been by dead reckoning, the new map, though a great advance, was still far from accurate. His revelations about slavery were eagerly seized upon and in some quarters he was even criticised for approving of it. He certainly accepted it—he

Pl. I (see p. 147). MUNGO PARK, 1771-1805

Reproduced from *Travels in the Interior Districts of Africa:* PERFORMED IN THE YEARS 1795, 1796 AND 1797 WITH AN ACCOUNT OF A SUBSEQUENT MISSION TO THAT COUNTRY IN 1805. Vol. I. By Mungo Park, Surgeon. London: John Murray, 1816. *Frontispiece.*



French Colonial Office.

Pl. 2 (see p. 151). A BAMBARA NEGRO

"The gentleness of their manners presented a striking contrast to the rudeness and barbarity of the Moors." *Mungo Park.*

French Colonial Office.

Pl 3. (see p. 151). A MOOR

"I could never contemplate their physiognomies without feeling sensible uneasiness."
Mungo Park.

French Colonial Office.

Pl. 4a (see p. 149). FALAISE DE BANDIAGARO (1600 FEET)—'MOUNTAINS OF KONG.'

Horizontally bedded ancient sandstones rising abruptly from sandy plains. Cliffs in background approximately 300-400 feet, in foreground, 600-700 feet high.

Pl. 4b (see p. 150). THE FALLS OF FELOU.

Typical of the great rivers of the Senegal and Niger and similar to the broken water at Busa (Boussa) in which Park was lost.

French Colonial Office.

had no choice—and recorded its cruelties often without explicit condemnation. As, however, much of his journal is equally objective—even when dealing with himself—we may take it that his words on parting with the slave convoy express his attitude on the subject : " Although I was now approaching the end of my tedious and toilsome journey, and expected in another day to meet with countrymen and friends, I could not part, for the last time, with my unfortunate fellow-travellers, doomed, as I knew most of them to be, to a life of captivity and slavery in a foreign land, without great emotion. During a wearisome peregrination of more than five hundred British miles, exposed to the burning rays of a tropical sun, these poor slaves, amidst their own infinitely greater sufferings, would commiserate mine ; and frequently of their own accord, bring water to quench my thirst, and at night collect branches and leaves to prepare me a bed in the wilderness. We parted with reciprocal expressions of regret and benediction. My good wishes and prayers were all I could bestow upon them and it afforded me some consolation to be told, that they were sensible I had no more to give."

To Park, slaves were fellow-travellers and not the subject of a Good Cause ; he accepted slavery as a fact, as indeed he did all of Man's inhumanity to man : it was his ability to thole his own share—larger than most—that carried him through hardships, bitter disappointments and barbarism that would have broken a more sensitive man. He was never sorry for himself and he assumed the same attitude in others. This did not prevent him from appreciating the virtue of charity : indeed the rare passages in this book in which he unbends are those which record with gratitude kindnesses shown to him for no reason whatever but pure *caritas*.

Returning to Scotland, he married Alison Anderson of Selkirk, daughter of his old master, and lived quietly in the Borders recovering the strength he had so over-taxed in Africa. It was two years before his fever and dysentery cleared up and his tortured nerves ceased to waken him at night with imagined terrors from Moors, wild beasts and the forces of nature. Eventually he asked Sir Joseph Banks if he might be entrusted with a further mission overseas and for some time it appeared likely that he would be sent to New South Wales. This scheme, however, fell though and Park reluctantly took up the practice of medicine at Peebles. Though he was popular and much appreciated as a doctor, he hated the work, rating the climate and fatigue of riding his rounds as worse than his African journey and certainly not worth the pittance that he earned. After only two years of this, Park eagerly accepted the offer of another Niger expedition, this time under the aegis of the Colonial Office. They were interested not so much in the course of the Niger as in the possibilities of trade and settlement and wanted precise information on this subject. Though the project was approved in principle, delay followed delay until eventually authority to proceed was given at precisely the wrong time of year. Even using the greatest haste, Park, now commissioned Captain, arrived on the Coast only in April, just as the hot season was beginning. He had with him as second-in-command his brother-in-law, Alexander Anderson, and

another Selkirk man, George Scott, who was to record the expedition in sketches. At Goree (then British) he raised from the garrison a party of thirty European volunteers under Lt Martin, and these, with his carpenters and stores, made a formidable responsibility at the best of times : to start into the interior in the hot season, with the rains imminent, was to court disaster. Park, however, had no option and he pushed on with his preparations with a brave face though serious misgivings must have been in his mind.

On the 27th of April, 1805, they set out with one Isaaco as guide and trouble at once arose : the asses would not carry their loads : the soldiers were stricken by heat : the convoy straggled to such an extent that it broke into two, taking different routes. Picking up their main rice supplies the next day, they found it quite beyond the capacity of their draught animals and more had to be bought. More refusals by asses and on the 8th of May dysentery appears among the soldiers. From the outset, Park seems to have been attempting independence of the villagers, camping outside settlements or indeed away from them and feeding on his own resources. Word went round that the convoy was going inland to buy slaves and that the column of asses bore rich merchandise for the purpose. They thus became the target for every highwayman and greedy chief along the route. On the 15th one of the soldiers died " in an epileptic fit." It may have been heat-stroke, for on the 18th Park laconically records of the river Nerico " the heat of the stream at 2 o'clock 94° Fahrenheit." With running water at 94° it would be interesting to know the temperature of the ground over which the convoy marched !

The 26th of May was an unlucky day, for two soldiers fell out on the march and in the evening a swarm of bees disorganised and demoralised the camp, killing two of the asses and stampeding the others. On the 20th and again on the 3rd of June only the threat of military action prevented serious exactions by chiefs. This sort of difficulty, presumably, accounts for Park leading the convoy across country. This avoided contact with villages but increased the difficulties of travel and on more than one occasion lack of water became serious. On the 8th one of the carpenters was too ill to travel and Park *left him behind* with a soldier to bury him. Death occurred the following day. Tornadoes now became frequent—the rains had come and with them mosquitoes. The soldiers began to sicken and had to be mounted on horses or asses : this left asses without drivers and they accordingly wandered and cast their loads : thieves took the opportunity to dart in and only firm action by Park prevented wholesale abduction of his goods and animals. Park himself had fever but worked with boundless energy, mainly at the tail of the column, gathering up and bringing in the sick and straggling men and animals. In this tragic manner the expedition floundered on. Soon the Europeans began to fall out daily : sometimes they overtook the column at nightfall, sometimes not : several times they arrived naked, having been stripped by thieves. Many had to be left behind, where possible in charge of the village head, whom Park entrusted with funds for the subsistence of the sick man. Many were buried by Park and his survivors. As the Europeans

weakened, their predators gained courage : Africans stole from them in broad daylight, even snatching Park's musket from his hands : lions and hyenas stalked them by night, the latter disembowelling their asses within a few yards of the camp. Heavy rain added to their discomfort, making cooking impossible and their rice therefore useless : night after night they lay down wet and rose wet. It is not surprising, therefore, that when they eventually saw the Niger near Bamaku on the 19th of August they had none of the asses with which they had set out, and of the thirty-four soldiers and four carpenters who left the Gambia, only six soldiers and one carpenter survived. Park himself had both fever and dysentery " and as I found that my strength was failing very fast, I resolved to charge myself with mercury. I accordingly took calomel till it affected my mouth to such a degree that I could not speak or sleep for six days. The salivation put an immediate stop to the dysentery, which had proved fatal to so many of the soldiers."

It was now necessary to propitiate the king of Segu and to this end Park sent very generous presents which eased all difficulties and by the 27th of September he was installed at Sansanding and preparing for his final embarkation. No large vessel was now necessary, unfortunately, and Park must have looked rather bitterly at the " pit saws " he had so painfully brought from England. The best he could do was to take the good halves of two defective canoes and join them together : " with the assistance of Abraham Bolton (private) took out all the rotten pieces ; and repaired all the holes, and sewed places ; and with eighteen day's hard labour changed the Bambarra canoe into His Majesty's Schooner *Joliba* ; the length forty feet, breadth six feet ; being flat bottomed, draws only one foot water when loaded."

Since reaching the Niger, five soldiers, Mr Scott and Mr Anderson had died, leaving only Park, Lt Martin and three other white men to man H.M.S. *Joliba*. Park appears to have been in good spirits and full of hope. Throughout the tragic journey from the Gambia he laments the loss of only one of the soldiers, William Allen : " he had naturally a cheerful disposition ; and he used often to beguile the watches of the night with the songs of our dear native land." Anderson he mourned with " I shall only observe that no event which took place during the journey ever threw the smallest gloom over my mind till I laid Mr Anderson in the grave. I then felt myself as if left a second time lonely and friendless amidst the wilds of Africa." Lt Martin he scarcely mentions, and one can only suppose that this is because he was of little significance. There is no evidence in the journal of him being of any special assistance : true, Park, with his captain's commission, was his senior and in full charge and yet we might have expected Lt Martin to organise at least the defence of the convoy and to be responsible for the thirty-four soldiers. It may perhaps be that Park does not do him justice in the journal but for this view there is no evidence whatever : on the contrary, a letter from Lt Martin to a friend contains the words " Whitbread's beer is nothing to what we get at this place (Sansanding), as I feel by my head this morning, having been drinking all night with a Moor." It would appear that Lt Martin was a total liability.

Such was the small party that sailed on the 19th of November,

1805. Park sent his journal and letters back to the Gambia with his faithful guide, Isaaco. To Sir Joseph he is heroic : " I shall set sail to the east with the fixed resolution to discover the termination of the Niger or perish in the attempt " : but to his wife he is tender and comforting. We may refer again to his significant concluding sentences, " We this morning have done with all intercourse with the natives ; and the sails are now hoisting for our departure for the coast."

Time passed and nothing further was heard of Park : rumour had it that he was lost but Alison refused to believe this to the end. Eventually, in 1810, the Colonial Office caused Isaaco to be traced and sent inland to seek information. By a remarkable coincidence he encountered Amadi Fatouma, one of Park's crew, and from him obtained a report whose truth has not been challenged.

Park had made it clear that he intended to force a passage to the sea : this policy was soon put into action. By the time they were abreast of Timbuktu they had had three skirmishes with hostile natives and subsequently took on up to sixty canoes at a time. One of the Europeans died, leaving *Joliba* with a complement of only eight, but as each had fifteen muskets ready loaded, their fire-power was more than equal to anything they were likely to encounter. A few brief halts were made to buy fresh food and on arrival at the boundary of Hausa country they stopped at Yaour, a riverside village, to land their guide, Amadi, who had now fulfilled his contract. Presents were given by Park to the local headman for transmission to the chief, who lived some little way in from the river. Unfortunately, Park said that *he did not propose to return that way* and the headman accordingly appropriated the presents and reported to his chief that none had been given. The latter therefore mustered his forces at the Busa (Boussa) rapids at what he knew to be a bottle neck in the river and there Park and his party perished, jumping into the river in an attempt to avoid the spears, stones and arrows which were aimed at them. Had he passed this point, it is most probable that he would have completed his task : as it was, twenty years elapsed before Clapperton and Lander reached Busa (Boussa) from downstream and so demonstrated that the Niger mouth was none other than the delta which had long been known as the Oil Rivers.

Such was the manner of Park's death. It was not unfitting that it should have resulted from the cupidity and double-dealing of a chief, for he suffered much at their hands : that his own fault should have been lack of guile is also typical. That he was attempting to shoot his way through and that his death was clean and swift has no doubt added to the romance surrounding his name. While he did not achieve his objective, his name and fame have inspired others from the time of his death onwards and his journals will continue to be a testimony to the indomitable spirit of man for time to come.

Copies of the original editions of Park's Journals are to be found in the larger libraries. A convenient, slightly abridged modern edition is *Mungo Park's Travels*, edited by Ronald Miller, London : J. M. Dent and Sons, Ltd. (Everyman Series), 1954. The best life of Park is probably still *Mungo Park and the Niger*, by Joseph Thomson, London : George Philip and Son, 1890.

RECENT PORT AND HARBOUR DEVELOPMENTS AT FREETOWN

H. Reginald Jarrett

Post-war conditions, bringing unprecedented consumer demands for a wide range of commodities, have enormously stimulated production of, and trade in, agricultural and mineral products in recent years. This is true of products from tropical lands no less than from temperate, and as West Africa is the nearest tropical area to the large consumer region of North West Europe she has shared to the full in this post-war boom. We can glimpse in some measure the motive force behind this boom from a comparison between certain pre-war and post-war prices. In 1938, for instance, Sierra Leone exported 63,697 tons of palm kernels valued at about £7, 2s. per ton, 1,066 tons of palm oil, at £15 per ton, 384 tons of cocoa at £15, 2s. per ton, and 38 tons of coffee at £21 per ton. In October 1952 prices for these same commodities *actually paid to the producers* at buying stations were £31, 12s. 6d., £41, 6s., £168, and £168 per ton respectively. There were comparable rises in mineral prices. It is not perhaps surprising that in view of the great concomitant trade increase port and harbour developments have proceeded apace since the close of the last war all along the Guinea Coast from Dakar to Lagos, not least at Freetown, capital and chief port of Sierra Leone. A small country of some 27,925 square miles, Sierra Leone is comparable in size with Scotland, and has enjoyed during the past decade not only an increasing demand for its farm produce, especially palm products,[1] ginger, coffee and cocoa, but also for its newly discovered mineral wealth—iron ore,[2] diamonds, and chrome ore. It is not, therefore, surprising that after half a century of frustration and largely abortive planning it became essential to proceed with the construction of a deep-water quay as soon as possible after the close of the last war, and the Queen Elizabeth II Quay was at long last opened for traffic on the 1st of May, 1954.

Since the time of the anti-slave trade patrols, Freetown harbour has been a base of prime importance for the control of the passage from North to South Atlantic. During both World Wars it was an anchorage and naval station of the first order, the spacious estuary allowing the assemblage and marshalling of the largest convoys, with a depth of water adequate for the ' Queens ' and the largest battleships. It was manifestly absurd that such a harbour should lack a deep-water quay, though the strength of the tidal currents, and the poverty of the territory make it understandable that such a project had never been completed.

It is not the purpose of this article to examine in any detail the geographical setting of Freetown ; that has been done elsewhere.[3] We might properly observe, however, that the capital lies along part of the northern coast of the Sierra Leone Colony Peninsula (Fig. 1) on a raised beach which falls away sharply to the Sierra Leone River in cliffs of about 50 feet high. This site has many advantages, as it is well-drained, free from mangroves and swamps generally, and yet in

earlier years it enjoyed an assured water supply although to-day water has to be piped to the large population. It is fortunate, as Figure 1 shows, that the configuration of the Sierra Leone River swings southwards the strong ebb currents so that tidal scour is strongest just offshore, and deep water is reached only a few yards from the cliffs. Very little dredging was required, therefore, even for the construction of the new quay, and the largest ships afloat can sail right into the river past Freetown. During the two World Wars this fine natural harbour was of first class importance in permitting the assembly of convoys.

The original site selected for the new settlement in 1787 appears to have been just north and north-west of Tower Hill (Fig. 2). A small stream known as Sanders Brook flows beneath the western slopes of this eminence and empties into Kroo Bay. It so happened that this small estuary was well known, for it had been a watering place for ships throughout many years—indeed, so regular was the watering that Temne kings used to levy a tax on ships for this service, and this tax became an important source of revenue to the royal house. It was perhaps natural, in these circumstances, that the first buildings to house the repatriated slaves who helped in the founding of Freetown were erected near to this well-known and useful spot, though in due course the city spread, after some vicissitudes, first eastwards and, at a much later date, westwards ; southward extension was ruled out by the Colony Mountains, so that from an early date the settlement was ' squeezed ' laterally between the mountains and the sea. The result of this is seen in the road plan, which is set out in Figure 2.

Linked with this question of the expansion of the city is the growth in its population. The most recent count was taken in 1948, and cannot be regarded as exact, but the estimated population then was 64,576, a density of about 13,453 per square mile. This is a high figure, the more so when we realise that 64,547 people were living east of Alligator River which flows northwards into the head of Kroo Bay. Within this closely-packed area certain slum patches carry an unbelievably-high population.[4] For instance, south of Susan's Bay is a slum with an average density of 487 persons per acre, or 23 people per house, and authoritative local opinion holds that since 1948 the situation may well have deteriorated as more Protectorate people are being attracted into the capital The significance of this in our present context will immediately be apparent when we recall that it is precisely through this particular congested area that eastward-moving traffic has to pass and this includes all traffic moving between the Protectorate and the old harbour (Fig. 2). This will be clearer after a glance at Figure 1, which shows that, as a result of topographical controls, traffic must move out of Freetown westwards or eastwards along the lower ground (the raised beaches) at the foot of the mountains. Westwards the road simply leads to the Atlantic coast, but the city's eastern borders look towards the Protectorate with its 2,000,000 inhabitants.[5] The railway and Protectorate road therefore leave the capital at its eastern boundary after traversing the greater part of the city's length on their way from the city centre.[6] This very difficult situation will receive further consideration at a later stage in connection with the siting of the new quay.

Fig. 1. The Sierra Leone River and the Colony Peninsula. 1. Colony boundary. 2. Chief roads. 3. Railways (north-bank line, private 3½-foot gauge for the transport of Marampa iron-ore concentrate for shipment: Government railways, 2½-foot gauge), 4. Freetown airport. Contours every 250 feet. Broad arrow shows direction of strongest currents of ebb flow down estuary. North, in outer estuary, water is always slack and too shallow for shipping; at lowest water sand can be seen towards middle of triangle.

It was as long ago as 1901 that a report was prepared by Messrs Shelfords, a well-known firm of engineers, on a scheme to build a deep-water quay in Freetown [7]—a reflection of the growing importance of this town and port at the turn of the century. Some indication of this growing importance can be realised from the increase in population which has continued throughout the city's existence, though records of early days are scanty and of doubtful accuracy. In 1820, however, the population was recorded as 4,785, and in 1836 as 11,763,[8] though Holman, in 1840 put the figure at only 5,000 or 6,000, including 110 Europeans.[9] But he may well have underestimated the total, for an article in the *Imperial Gazetteer* gives the population in 1847 as 18,000, which would accord more with Martin's figures. The rise has continued throughout this century from 34,090 in 1911 [10] to 64,576 in 1948. These figures clearly reflect the growing importance of the city as the capital and chief port of Sierra Leone, an importance also emphasised by the considerable increase in port activity which has continued throughout this century, though it seems possible that the volume of trade during last century remained fairly steady. In 1824, for instance, 20,372 tons of goods were exported from Sierra Leone, and 13,993 imported, while corresponding figures in 1836 were 18,372 and 19,901 tons.[11] In 1898 the total tonnage of cargo discharged at Freetown from March until August, both months inclusive, was 13,074, giving, purely on arithmetical grounds,[12] a monthly average of 2,179 and a total for the year of 26,148, while in 1897 the tonnage of ' African produce ' exported from Freetown (January to December) was 11,381.[13] It is a far cry from those days to the tonnages handled in more recent years—347,126 (246,796 unloaded, 100,330 loaded) in 1946 ; 226,234 (138,722 ; 87,512) in 1950 ; and 317,185 (187,703 ; 129,482) in 1953.[14] When it is realised that without a deep-water quay all these goods had to be handled in lighters, often working in quite rough waters, it will be evident that the need for a deep-water quay has become very pressing in recent years.

It might be interesting to make two further observations at this point, both having relation to the shipping using the port. In the first place, it is possible to discern a definite pattern in the various shipping routes which converge upon Freetown. Four major routes can be recognised—to Lagos and to the Union of South Africa southwards, and to North West Europe (including the United Kingdom) and to the United States northwards. Intermediate stops are, of course, made.[15] Secondly, it is intriguing to notice that 926 vessels registering a total net tonnage of 2,989,510 were in 1953 cleared from Sierra Leone, mostly from Freetown,[16] and according to Morgan's classification this puts Freetown in the same rank as ports such as Amsterdam, Greenock and Port Glasgow, and Manchester ![17] It seems that Morgan did not allow for the type of port like Freetown with a large amount of ' through ' traffic calling to load or unload a comparatively small volume of goods, for such a claim obviously cannot be allowed, yet at the same time this is an important commentary on the amount of activity in the port. It was not uncommon, before the new quay was opened, to see five or seven ships anchored in the old harbour awaiting

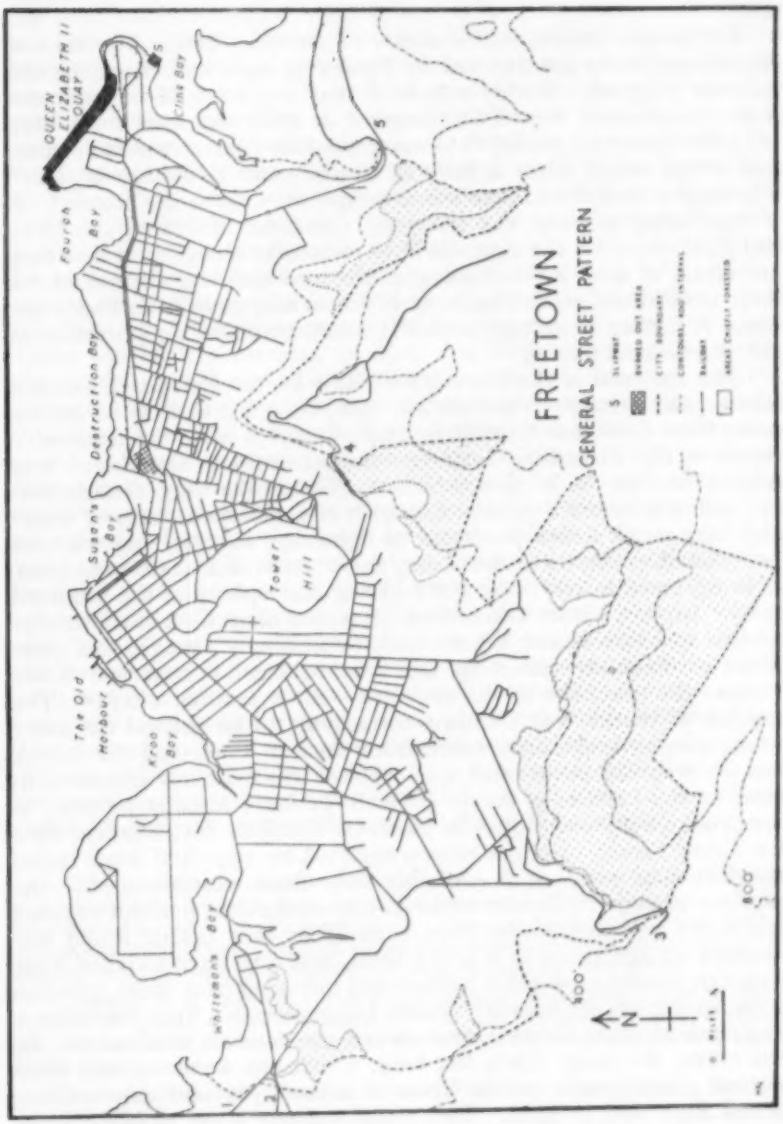


Fig. 2. Freetown: A General Street Plan.

1. Coastal Road. 2. To Wilberforce and Regent. 3. To Hill Station and Regent. 4. The Protectorate Road. Forested areas are shown only within the city boundary.

attention as soon as lighters could get to them ; such a sight is not now seen.

Let us now return to the matter of the quay itself. The earliest recommendations put forward by Harley in 1901 concerned the old harbour (Fig. 2). Harley suggested that a pier could be built out from Government Wharf (constructed in 1867 and used until May 1954 for nearly all traffic) [18] to accommodate three steamers at once, and which would allow at least 26 feet of water at the lowest tide.[19] The total cost of the scheme was not expected to exceed £50,000 ! It is interesting to note the following comment of Harley's : "The principal objection the captains have to coming alongside is that they are afraid of their crews coming ashore and unfitting themselves for their work therefore this question of fences and gates is an important one. A further advantage is that it would preclude the possibility of any contraband passing."

The approval of the Secretary of State for the Colonies for such a scheme had been given in October, 1900, the original proposal having come from Governor Cardew in 1898, but even after the favourable report of the Consulting Engineers the scheme was abandoned very largely because of local opposition. There was very considerable opposition from the Freetown Chamber of Commerce, many of whose members made a nice profit out of lighterage charges, and who did not relish the prospect both of losing these profits and, at the same time, of being taxed in respect of the building and upkeep of the proposed quay. In 1913 Messrs Coode were preparing plans for a much smaller scheme at Government Wharf, and, interestingly enough, had their Resident Engineer surveying the area between Farran and Kline Points—the exact site of the new quay—for a possible wharf.[20] The coming of World War I caused the scheme to be shelved for many years, despite suggestions made from time to time, and no further positive step was taken until 1946 when it was definitely proposed, in view of the increasing urgency which we have already noticed, to construct a deep-water quay as part of a Ten Year Development Plan for Sierra Leone. Designs were completed by 1947 and work began the following year. It is probably only those who have made the perilous passage by lighter between ship and shore, perhaps slipping down wet companionways from a mailboat to a lighter which was heaving up and down in a heavy swell, and who have watched their own cars loaded on to other lighters and unloaded from them, who can truly appreciate the heartfelt thanks which ascended from Freetown—and, indeed, from Sierra Leone—when the decision was known. In the event, the quay, 1,203 feet long, which can accommodate three normal cargo vessels or two liners at a time, provides easy walking access from ship to road. Two 3-ton and one 5-ton mobile electric cranes travel almost the whole length of the wharf, while three transit sheds, each with a floor area of 22,000 square feet, lie a few yards back from the water. The central shed is double-storeyed, the upper floor housing Customs Control together with various Government and Commercial offices. Associated buildings nearby include commodious warehouses for the Sierra Leone Marketing Board. Since

two 1,100-ton tugs are required for the berthing of vessels, a slipway has been built just south of Cline Point [21] (Fig. 2) for their maintenance.

This, then, is the Queen Elizabeth II Quay which was opened in May, 1954, and our final task may well be to enquire why this particular site was chosen, lying, as it does, in an undeveloped part of the city near its eastern boundary at a travelling distance from the centre of about two and a half miles. It will, of course, be evident that for the reception of goods from and the despatching of goods to the Protectorate the Cline Town site is well chosen—a factor of the highest importance. It might also be borne in mind that less than a quarter of a mile to the south of the quay lie the railway workshops of Cline Town, Sierra Leone's largest industrial undertaking, together with Cline Town station, which it is proposed to convert into the railway terminus. It is then envisaged that the present railway between the city and Cline Town will be torn up, and we may well at this point return to the observations made earlier in this article regarding the road and rail routes to the Protectorate which now traverse the congested East Ward, including the Susan's Bay slums. Anything which relieves this congestion is to be welcomed, and this present scheme will help considerably ; it is certain that many accidents will be avoided when Protectorate traffic does not need to pass along the crowded streets of the East Ward. Figure 2 also shows an area in this part of the city which was gutted by fire in 1940 and which is not yet rebuilt. While final decisions are still awaited, it should prove possible to replan this area, relieved of its railway and most of its road traffic, in a manner worthy of a country's capital. In similar vein, it is hoped to demolish entirely the present ugly Government Wharf, and to lay out instead a public park and recreational centre backed by the present Cathedral and a civic centre of generous proportions. It is expected that the Cline Town area generally will soon develop into a commercial and industrial region ; it will be an interesting task for a geographer in, say, ten years' time to evaluate the extent of the influence of the Queen Elizabeth II Quay on the urban geography of Freetown.

[1] It is regrettably true that Sierra Leone is not at the moment producing sufficient palm products for her own needs, and for the first time considerable supplies of palm oil are being imported, chiefly from Nigeria. Rice, too, is now being imported from Burma and Italy. This is thought to be necessary because so many farmers are illicitly digging for the widespread diamonds deposits, and forsaking their farms.

[2] JARRETT, H. R. LUNSAR.—A Study of an Iron Ore Mining Centre in Sierra Leone. To appear in *Economic Geography*. The iron ore is shipped from Pepel, at the terminus of the mining company's railway about 12 miles up the Sierra Leone River (Fig. 1).

[3] JARRETT, H. R. The Port and Town of Freetown. *Geography*, 1955, No. 188, 40 (2) : 108.

[4] *Report of the Interim Town Planning Committee*. Freetown : 1948, p. 4.

[5] *Census of the Colony and Protectorate of Sierra Leone*. Freetown : 1949. Colony, 124, 657 people, Protectorate 1,733,618. This may well be an underestimate.

[6] The commercial 'heart' of the city lies between the old harbour and Susan's Bay, north of Tower Hill.

[7] HARLEY, A. *Report on the Freetown Wharf Survey*, 1901. *MS.* only.

[8] MARTIN, R. M. *Statistics of the Colonies of the British Empire.* London : 1839, pp. 536-7.

[9] HOLMAN, J. *Travels in Sierra Leone, etc.* London : 1840, p. 113.

[10] GODDARD, T. N. *The Hand Book of Sierra Leone.* London : 1925, p. 25.

[11] MARTIN, R. M. *Op. cit.*, pp. 542-3. No separate figures are recorded for Freetown which dominated the trade of Sierra Leone then as now.

[12] The danger of this is fully realised, but as the months given include most of the rainy season the year's total may well be greater rather than smaller than that suggested here.

[13] HARLEY, A. *Op. cit.* Appendix. It seems that systematic figures were not kept at this time, but those quoted were recorded by order of Governor King-Harman in an attempt to assess the need for the proposed quay.

[14] *Annual Trade Reports.* Freetown : 1946, 1950, 1953. Tonnages rather than values have been used here as affording a clearer index of the scale of the port activities. A small diamond needs far fewer port installations for handling than would motor cars or palm kernels of equivalent value.

[15] For further details : see JARRETT, H. R. Freetown. A Study in Space Relationships. *Sierra Leone Studies,* June 1954, pp. 98-100.

[16] The exact Freetown figure is not available, but the tonnage clearing from the other ports (Bonthe and Sulima) is very small indeed.

[17] MORGAN, F. W. *Ports and Harbours.* London : 1952, p. 19.

[18] The three jetties of Government Wharf can be seen on Fig. 2 projecting towards the old harbour.

[19] HARLEY, A. *Op. cit.*, p. 1.

[20] COODE, MATTHEWS, FITZMAURICE and WILSON. *Specification for Additional Jetty Accommodation at Government Wharf.* Crown Agents, London, 28th March 1913.

[21] The older spelling " Kline " is not now used.

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THE POPULATION OF EASTERN NIGERIA

R. Mansell Prothero

In conclusion an appendix to the report of the Population Census of the Eastern Region of Nigeria [1] states : " There is probably no part of Africa where the urge to all forms of progress is as powerful or which has achieved more rapid advancement in little more than half a century of close contact with the world."

The contacts of the coastal areas through slaving, the trade in palm oil and the activities of missionaries extend further back in time. The interior with its rapidly growing towns, its flourishing markets and its networks of roads supplemented by rail and river transportation has developed since the beginning of the present century. Economic progress has been paralleled and assisted by a general desire for advancement which is undoubtedly much stronger than elsewhere in Nigeria. Demands for education far exceed the available facilities ; politically the Region is very alive even if at times unstable. In recent years local government has been re-organised and is now based on a system closely allied to that in the United Kingdom. Unlike large parts of Western and Northern Nigeria the East had no traditional system of government involving control of large areas and populations by a central authority. Allegiances among the Ibo-speaking peoples, the dominant element in the population, and their neighbours were particularly local and centred on the family and the clan. This characteristic has been a source both of strength and of weakness in development during the last fifty years. In some respects old ways and traditions have been more easily swept aside and the people have accepted new ideas. At the same time there was little existing social and political structure through which new elements could be introduced.

With rapid development in the social, political and economic fields the need for sound demographic material is paramount as a basis for planning. And yet, prior to the Census of 1953, that available for the Eastern Region of Nigeria was of more doubtful value than that for the remainder of the country. In the early decades of British administration, the people of the East, lacking any experience of central authority, strongly resisted attempts at taxation or measures, such as the taking of a census, which appeared to be directed towards this end. The Native Authorities which had been created were weak and the contrast with the Native Authorities of the Mohammedan North, which for many years have conducted their own censuses for the purposes of tax assessment, is most marked.

In view of disturbances in Owerri and Calabar Provinces in the years immediately prior to the 1931 Census the authorities decided not to attempt the collection of any new data but to compile the Census from the information which already existed. The result was that the estimate of total population submitted (4,691,000) was about three-quarters of a million less than the estimate (5,440,000) made in 1921. There was no other evidence to suggest that the population had de-

creased during the decade or that there had been an over-count in 1921. In the Census of 1953 the population was *enumerated* for the first time. This gave a total of 7,971,187 for the Region, which was nearly 50 per cent greater than the pre-census estimate (5,800,000) made in 1952, though this seems to have been absurdly low. There is therefore little to be gained from direct comparison of the results in 1953 with those of previous censuses in view of the unreliability of the latter. Without any confirmatory evidence the growth rate appears to be in the region of 2 per cent per annum.

The Census was organised by the Administration which was responsible for finding and training Supervisors and Enumerators under the direction of the Regional Census Officer. Compared with the Northern Region the task of finding persons suitable in character and education was generally much simpler owing to greater education facilities and a resulting larger number of literates. Only in the Cameroons and Ogoja Province did this problem have to be faced. The propaganda for the Census by radio, newspaper, pamphlet, poster, gramophone and mobile cinema seems to have been particularly well organised and to have played a considerable part in determining the satisfactory manner in which the Census was accepted by the people. There was one inflammatory outburst. The only defect in the propaganda may have been in the emphasis placed on the fact that allocations of finance for development would be based on the results from the Census. This undoubtedly resulted in a tendency to over-counting and was a feature of the censuses in the other Regions. Only in Degema Division was this serious, the original returns showing an increase of 227 per cent on the most recent estimate. A re-count showed that the increase was one of 47 per cent.

In the Rivers Province and the two provinces in the Cameroons the Census was taken in April to avoid the heavy rains of the later months which would have made the movement of enumerators impossible. As it was, enumeration in the creek areas involved many miles of travel by canoe to include isolated villages. The remaining provinces were counted in June. Owing to difficulties of movement among widely scattered settlements counting in some areas extended over a period of two weeks ; in the large towns it was completed in one day. On an average each enumerator counted 1,400 people.

The factors discussed above impose considerable limitations on census-taking. The detail to be included has to conform with the capacity of the enumerator and that of the person supplying information. The relative value of the different categories of information in the Census of the Eastern Region therefore varies considerably. It is estimated that the figure for the total population is accurate to within 3 per cent ; but the data for age for example, even though recorded in very broad groups, are of far more questionable accuracy.

The population is very unevenly distributed. Over 20 per cent lives on under 5 per cent of the total area of the Region, while a little less than half of the area carries only 10 per cent of the population. The broad pattern of this variation is shown in the density of population by divisions (Fig. 1). The highest densities (over 600 per square mile) [2]

are found in divisons which lie for the most part between the valleys of the Cross and Imo Rivers and between the Imo River and the River Niger. They form two concentrations ; in the Aba-Ikot Ekpene-Uyo Divisions of Calabar Province and in the Orlu-Okigwi Divisions of Owerri Province. They are the highest average densities found in Nigeria and for that matter in West Africa, and are indeed among the highest for the whole continent. An average density of over 850 per square mile as in Orlu Division indicates that there must be considerable areas with over 1,000 per square mile. In the other divisions similar densities must be common.

Fig. 1. The Density of Population (by Divisions) in the Eastern Region of Nigeria 1953. (Port Harcourt has been omitted.)

Densities of between 300 and 600 per square mile are found in many of the divisions adjacent to the two main concentrations. They are only relatively lower and are higher than the average density for any division in Northern Nigeria. Only two divisions in the Western Region have average densities exceeding 300 per square mile and comparable figures are as follows :—

Area with average density (by Divisions) over 300 per square mile in

Eastern Region . . .	19,321 square miles
Western Region . . .	4,521 " "
Northern Region . . .	—

Relatively low densities (under 100 per square mile) are found in two areas of the Region : east and north-east, in the highlands of the Cameroons and Ogoja Province ; and south in the deltas of the Niger

and the Rio del Rey Rivers. It is noteworthy that densities of over 300 per square mile reach the coast in the Opobo and Eket Divisions of Calabar Province, between the estuary of the Cross River and the Niger Delta where creek and swamp are absent. In both the highland and the coastal areas there is much land—rock outcrops, steep slopes, waterways and swamps—which is unsuitable for occupation and cultivation. The average densities for these areas are therefore no indication of the actual densities in the habitable parts.

Some of the land problems of the high density areas have been discussed elsewhere.[3] They are very real and under present conditions must inevitably become more severe as the population increases. Already they influence temporary and permanent movements of people. Farmers migrate to the towns for at least several months of the year to work as labourers in order to supplement their resources. Along the northern fringe of the high density areas Ibo farmers, from Nsukka and Abakaliki Divisions, are pushing into the less densely settled areas of the Igala Division of Kabba Province and the Idoma Division of Benue Province both of which are in the Northern Region. There is a similar movement across the River Niger from Onitsha Division into the Asaba Division of Benin Province. The number that had moved into the Idoma Division was estimated in the 1952 Census of the Northern Region to be about 26,000. In one of the southern districts of Idoma, Ibos form 83 per cent of the total population and in another district 49 per cent. Naturally their entry into the lands of the Idoma people is a source of continual friction. Land disputes are a major administrative problem, as they are also in the high density areas of the Eastern Region itself.

A different form of economic incentive causes the movement of people into the southern parts of Victoria Division in the Cameroons to work in the former German plantations which have been managed since the war by the Cameroons Development Corporation. The local people contribute only a small part of the labour force and this is of poor quality. In Victoria Division Ibos form nearly 20 per cent of the total population and with Ibibios they make up nearly a quarter. Further evidence of the strong migrant character of the population is provided by the excess of males over females. The latter form only 35 per cent of the total population and the disproportion between the sexes is so great that it cannot be accounted for by the plantation labour alone.

Apart from noting that Ibo-speaking peoples account for 61 per cent of the total population of the Eastern Region, lack of space prevents any discussion of tribal composition. Urbanisation was completely alien to this part of Nigeria before the establishment of British administration. The five largest towns have all grown up in response to economic developments in the present century; 14 per cent of the total population are recorded as living in settlements "... forming compact groups ... with a population of not less than 5,000." The comparable figure for the Northern Region was 9 per cent; that for the West has not yet been published but it will certainly be much higher than for either of the other regions.

Earlier contacts with Europeans along the coast and the influence of Christian Missions, more particularly in this area than in others, is clearly reflected in the Census data relating to literacy and religion. The data are explained by Figure 2. The correlation between a comparatively high literacy rate and a high percentage of Christians in the population is very close. It can be fairly said of large parts of the Eastern and Western Regions that the foundations of education were firmly laid by the Missions, and on these foundations Government schemes for education were built. The importance of missionary work—in the Eastern Region that of the Church of Scotland Mission and the Roman Catholic Mission particularly[6]—within these schemes remains undiminished. Its contribution has done more than anything else to put the Eastern and Western Regions in such a favourable position educationally as compared with the North. In the latter Christian Missions have been virtually excluded from the Mohammedan areas.

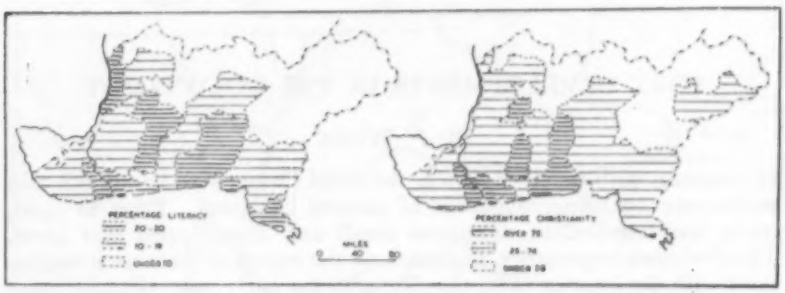

Fig. 2. The Distribution of Literates (over 7 years of age) and Christians in the Eastern Region of Nigeria 1953. (Port Harcourt Division has been omitted.)

It is hoped that a full analysis of the data in the 1953 Census of the Eastern Region will be carried out. Much useful information should be gained for the study and solution of social and economic problems which face the Region now and will do in the future. The Census provides sufficiently accurate data to serve as a foundation for future demographic studies. Direct comparisons with material from censuses in the past are of little value but a basis has now been established for comparison with the more accurate data which should become available in the future. The geographer, however, should remember that the material with which he works varies very considerably in its accuracy between one part of the world and another. Insufficient emphasis is given to this fact in the publication of census data. Until first-hand acquaintance is made with the circumstances of census-taking it is not always fully realised that a census like that of the Eastern Region, even in 1953, is only comparable in its broadest aspects with, say, the Census of Great Britain in 1951. This may appear to be a statement of the obvious, and yet the writer has noted

the use of African census material on several recent occasions without due note being given to this most important fact.

[1] *Population Census of the Eastern Region of Nigeria* 1953. Department of Statistics, Lagos, 1955. At the time the Census was taken the two southern provinces of the British Cameroons were included with the Eastern Region. As a result of the constitutional changes since that time they have become 'quasi-federal' territory with a separate administration.

[2] The density of Port Harcourt Division, an entirely urban area, has not been considered.

[3] GROVE, A. T. Land Use and Soil Conservation in parts of Onitsha and Owerri Provinces. *Geological Survey, Nigeria.* Bulletin No. 21, 1951, and
——Soil Erosion and Population Problems in South East Nigeria. *Geographical Journal*, 1951, CXVII (3) : 291.

MORGAN, W. B. Farming Practice, Settlement Pattern and Population Density in South-Eastern Nigeria. *Geographical Journal*, 1955, CXXI (3) : 320.

[4] In 1846 the Reverend Hope Waddell brought the Scottish Mission from the West Indies to Calabar.

PORT DEVELOPMENTS IN THE GOLD COAST

H. P. WHITE

IN common with much of Africa, the Gold Coast, with its smooth and surf-beaten coastline, is devoid of natural harbours. Prior to 1928, trade was handled at numerous small and ill-equipped surf ports. Their relative importance depended on the extent of their communications with the interior (Fig. 1). Thus, in the early years of the present century, Axim and Cape Coast, at the mouth of the navigable Ankobra River and at the start of the Kumasi trail respectively, were overtaken by Sekondi and Accra, which had become railway termini. Sekondi was selected as being the nearest roadstead to the goldfield at Tarkwa and also as the one with the easier route inland. Accra was chosen as the terminus of the eastern line as it was the commercial and administrative headquarters as well as one of the best roadsteads in the eastern part of the Colony. All these surf ports were strictly limited in capacity and were therefore a brake on the development of the economy, which depended on expanding the volume of exports and imports. Some relief was gained by building a breakwater at Accra, behind which the surf boats could beach in calm water, and a pier through the surf at Sekondi, from which large capacity lighters could be towed out to the ships anchored offshore. Even so, by 1918 the need for a deep-water port had become imperative.

A site was selected at Takoradi, adjoining Sekondi, and eventually the new harbour, its two moles enclosing 220 acres of deep water, went into full service on the 3rd of December, 1928. Two general cargo berths with a depth of 28 feet, coal, oil and manganese berths and moorings for six vessels were provided. There was also a lighter-quay for transferring cargo to and from moored vessels. In spite of the

world depression traffic grew and in the year 1938-9 ·4 million tons of exports and ·3 million tons of imports were handled as well as over 10,000 passengers, a very large proportion of the total trade of the country. It had become the focus of the road and rail system in the south-western part of the country and had superseded all the surf ports west of Cape Coast. In addition, road development in the rest of the country had reduced the number of surf ports in the eastern part to six, of which only Accra had any real importance.

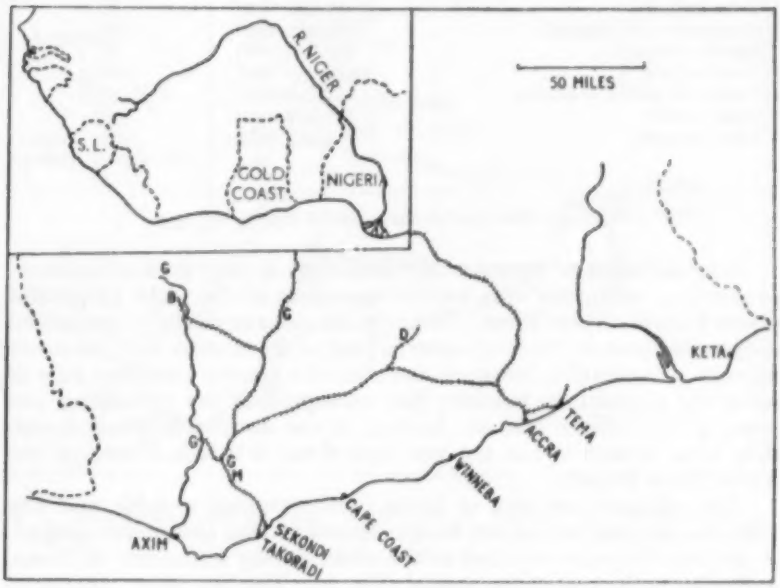

Fig. 1. Ports of the Gold Coast.
G-Gold : M-Manganese : D-diamonds : B-bauxite : S.L.-Sierra Leone.

During and after the war the economy of the Gold Coast expanded at a greatly accelerated rate, a process which shows little sign of slowing down. Port facilities had therefore become quite inadequate by 1950 and Takoradi was chronically congested. The severe inflation of 1950-2 was partly due to the physical inability to import a volume of goods commensurate with the amount of money in circulation. It was necessary to enlarge Takoradi, a work which started in 1949 and which has recently been completed. There are now five general cargo berths and four berths equipped for dealing with manganese, bauxite, petroleum products and coal respectively. The equipment for loading timber has been improved and there are now eight moorings. Covered storage is provided for 50,000 tons of cocoa and the railway facilities enlarged. The trade of the port is summarised in the following table :—

THE TRADE OF TAKORADI

Year ending 31st March 1954

	1953-54	*Percentage increase over* 1938-9
Number of vessels entering . .	985	31
Number of passengers . . .	18,492	78
Gross tonnage	5,617,360 tons	61
Manganese ore shipped . .	767,005 tons	160
Bauxite shipped	97, 800 tons	*
Total exports	1,353,850 tons	186
Petroleum products landed . .	174,638 tons	96
Coal landed	100,848 tons	47
Total imports	714,939 tons	133
		*No export 1938-9

Source: *Gold Coast Railway Annual Report*, 1953-4.

Interest had now turned to the possibility of large-scale aluminium production, using the vast bauxite resources of the Gold Coast and power from the Volta River. The original plans envisaged a specialised deep-water port in the south-eastern part of the country as a necessary adjunct. Eventually, however, the idea of a general port, not only to serve the aluminium industry but to supersede the remaining surf ports, gained official favour. In 1951 it was decided to proceed with this, even though it has not yet been decided to commence on the Volta River Project.

The offshore contours at Accra itself were not suitable and any place to the west would not be convenient for the aluminium project. A site was therefore selected at the small fishing settlement of Tema, 15½ miles to the east of the capital (Fig. 2). The first stage, completed by the end of 1954, was the provision of services, for only a track led to the village. Roads were built, a water supply piped from Accra, and a 16½-mile branch line constructed from the Gold Coast Railway at Achimota. Housing had also to be provided. A road to the Volta ferry at Senchi, where there is to be a bridge, is also under construction. The cocoa areas of Togoland will then be in direct communication with Tema and traffic can be diverted from Lomé in French Togoland.

The several million tons of material needed for the moles are to come from a large inselberg, the Shai Hills, 20 miles north-east of Tema. A railway, which will later be extended to the site of the aluminium smelter at Kpong, has been built out to these hills. Stone is now coming down and work on the moles began early in 1955.

The small mud-built village of Tema with its 1,200 inhabitants will be replaced by a town of at least 20,000. It is being planned and built by the Tema Development Corporation which is modelled on the bodies responsible for the new towns in Britain. The long-term effect on Accra can only be conjectured. Its rapid growth will certainly be checked and it will lose its functions as port and fishing centre. Industry

will also be attracted to the new port. Possibly a large conurbation will develop, embracing Accra, Tema and the fishing settlements between. It may be that Tema will outstrip Accra as Takoradi has outstripped Sekondi.

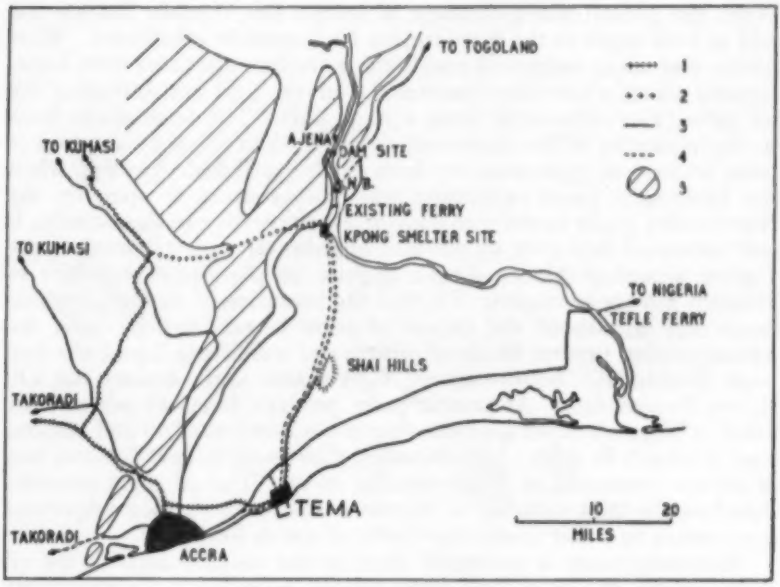

Fig. 2. Tema Harbour and the Volta River Project. 1. Railways. 2. Projected railways 3. Main roads. 4. Main roads under construction. 5. High ground. N.B.—New Volta Bridge (under construction).

If the Volta River Project is completed, the future of Tema is obviously assured. But although there is not the large mineral production in the eastern Gold Coast that there is in the west, production of cocoa and timber is considerable and there is a growing volume of imports such as petroleum products, structural steel and heavy machinery which will keep the new port busy. Surf ports are becoming increasingly expensive to operate and are unable to handle traffic in bulk. Soon, instead of thirty surf ports along the 300 miles of coastline, there will be two large and well-equipped artificial harbours. This process is going on throughout West Africa where Freetown, Monrovia and Abidjan have all been provided with deep-water quays in the last 15 years.

THE NIGERIAN OIL PALM INDUSTRY

W. B. Morgan

With the present world-shortage of animal fats Western Europe has had to look more to the inter-tropics for vegetable substitutes. Margarine and many soaps and cooking fats are manufactured from inter-tropical oils of which those expressed from the fruit and kernels of the oil palm (*Eleis Guineaensis*) form a large part. The trade dates back to the beginning of the nineteenth century, when less than 200 tons of palm oil were shipped annually from the Niger Delta. By 1834, when the McGregor Laird expedition was endeavouring to open up the Niger-valley trade in order to provide an alternative to slave-traffic, it was estimated that over 13,000 tons of palm oil were exported to the United Kingdom alone. Demand grew as population densities in Western Europe increased. By 1890 the invention of oil seed crushing machinery stimulated the export of palm kernels and by 1903 the hydrogenation process for de-odorising and solidifying liquid oils had been completed. South-eastern Nigeria was aptly named the Oil Rivers Protectorate. At present palm produce forms 28 per cent by value of Nigeria's exports, amounting to 201,000 tons of oil and 403,000 tons of kernels in 1953. It is estimated that an additional 500,000 tons of oil are consumed in the producing areas. The oil palm provides therefore the most valuable of Nigeria's exports and a most important supplement to a diet consisting chiefly of starch foods.

Generally there is no upper limit to the rainfall suitable for oil palm growth, the lower limit being usually accepted as approximately 60 inches per annum. However, the northern limit of oil palms appears to coincide with that of the Rain Forest which is found in areas often receiving well below 60 inches, but which have high dry-season humidities. The palm belt thus defined covers almost the whole of the Southern Provinces of Nigeria (Fig. 1) extending northwards along the chief river valleys, and is a region of highly acid and often very sandy soils. There is, however, a distinction between the east and the west, taking the dividing line as the eastern edge of the Yoruba plateau, defined by the escarpment between Owo and Benin Rivers. Palm growth in the east is denser than in the west and is paralleled by greater concentrations of population. Kernel exports in the west are greater by value than oil exports, whereas the reverse is the case in the east. Moreover, the quantity of oil exported from the west has tended to decline in recent years whilst it has increased in the east. Generally, western oil is more suitable for local, edible purposes than the eastern product, and finds a readier market in other parts of Nigeria. The remainder, after meeting local demands, which appear to be increasing, provides only a small surplus for export. Palm kernels, on the other hand, need crushing and therefore enter much more into the export market. In the east there is a much greater density of palm growth and approximately three-quarters of the palm oil exported passes through Port Harcourt and Degema. To the Ibos of Eastern Region the oil

palm provides the chief commercial crop, whereas to the Yoruba of Western Region cacao is at present more attractive.

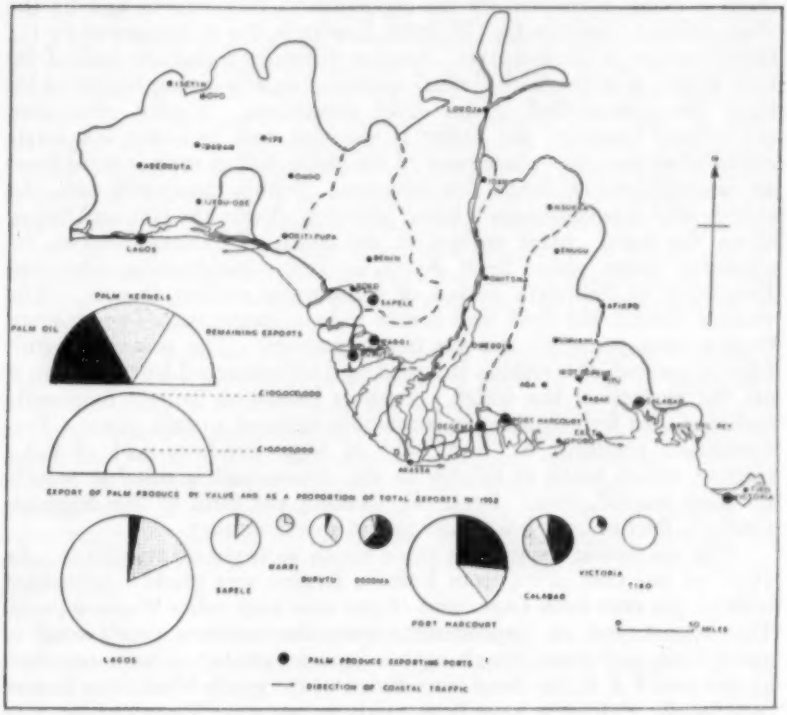

Fig. 1. Oil Palm Produce Hinterlands of Southern Nigeria.

Plantation methods of oil palm cultivation are restricted to a few areas in Calabar and Cameroons Provinces. The industry is mainly the business of small farmers who either plant and even manure palms in thick groves around their compounds, or preserve those growing in less dense stands on the farmlands. Generally the former are owned by individuals or families, whilst those on farmland are owned by the community or by the 'extended', large, family-unit. In parts of Eastern Region local regulations permit community cutting of palms on all land for three months in the year in order that every man may have enough to pay his tax. Private rights necessary to develop plantations are thus at variance with customary law and it is difficult to induce people to adopt improved methods of palm cultivation. The little private land existing has often been obtained in pledge for a debt and may be redeemed without compensation for any improvements effected.

An oil palm reaches maturity after approximately 15 years with a height of about 40 feet. The shorter palms are naturally preferred for cutting and quite often the taller are abandoned owing to the dangers

attendant on climbing. Most palms grow wild and no attempt has been made by farmers to improve quality by selection. Such improvement is being attempted by the Agricultural Department and by the West African Institute for Oil Palm Research, but is hampered by the family nature of the industry. Another difficulty is that the bulk of the fruit grown is of the thick-shelled variety generally giving higher yields than the thin-shelled under wild conditions. Under plantation conditions, however, the latter is superior and provides less waste material so that its replacement of the thick-shelled type is considered an essential part of future development. Within the family unit, the cutter, who is occasionally a hired labourer, climbs the tree and brings down the fruit. Most cutting in the south of Eastern Region, for example, takes place from April to June—incidentally after the December to February period of community cutting is over. The women detach the fruit and steam it in a cauldron. The steamed fruit is then pounded and the nuts separated. The remaining fruit fibre is pressed, the residue is boiled and oil extracted by skimming it off the surface of the water. Poor or damaged fruit is frequently included and fermentation is commonly allowed to take place. Fermentation produces a 'hard oil' of high free-fatty-acid (F.F.A.) content which tends to solidify in the drums and is suitable mainly for soap manufacture. Such oil, forming the bulk of the Nigerian product, fetches only low prices in the world market.

The marketing board has done much to improve standards. In 1951, 71 per cent of oil from Eastern Region was grade I compared with 31 per cent from Lagos and 18 per cent from other Western ports. This represented an improvement over the previous year's total of grade I oil, and since March 1950 a 'special grade' of not more than 4½ per cent F.F.A. has been introduced whilst grade V oil is no longer purchased. Attempts have been made to improve the extraction rate of oil. Primitive methods will express only 45 to 55 per cent of the oil content of the fruit. Hand presses (expressing less than 20 per cent of the Nigerian total) will produce 65 per cent. Oil mills, which deal with a still smaller proportion of the Nigerian total (1 per cent) will express 85 per cent of oil content, nearly double the production by the chief means used at present. These mills, known as Pioneer Oil Mills and forming a branch of the Regional Production Development Boards, can produce higher quality oil and offer greater returns to the producer. A difficulty is that the fruit offered tends to be very irregular in supply, but despite this and despite demonstrations in Eastern Region against the erection of the mills a plan to build these units at distances of eight to ten miles from one another throughout the oil palm belt of Eastern Region has been put in to operation.

The bulk of the traffic in palm produce focusses on the Port Harcourt railway, served by its mainly east to west system of roads. Here cyclists, in columns several miles in length, are commonly seen conveying oil in four-gallon kerosene and petrol tins; six to eight tins is the normal load on one cycle although a ten-tin load is not unknown. Such cheap conveyance is competing very successfully with lorry transport which has difficulty in finding sufficient loads for the return

journey. Of secondary importance are the river system leading to the Benin ports, the rail and road system to Lagos, the Cross River route to Calabar and the rail and roads to Victoria. Occasionally smaller ports like Opobo with its Imo River route attract a little traffic which is then shipped coastwise to the bulk-oil installations at the main harbours. The collecting of oil in bulk at a few ports and its subsequent shipment by oil tankers has considerably reduced the costs of handling. In some instances, however, this policy of concentration on fewer centres has been unfortunate, as in the case of the elimination of the port of Koko in favour of Sapele, since a large part of the produce now brought to the latter must bear the extra cost of being unloaded from lorries and ferried across the river. A little palm oil of exceptionally high grade, almost all from plantations owned by the large companies, is shipped in drums in order to preserve carotene content according to the specification of the British Ministry of Food.

If the efforts of the Agricultural Department and of the Oil Palm Research unit are successful in introducing superior types of palm and better methods of tending then the future of Nigeria's chief export-industry should be satisfactory. With improved methods of extraction production of oil can be increased considerably without any increase needed in the area under palms. If, however, the older techniques prevail, then sales may be seriously affected by the competition of other vegetable oils and of the rapidly growing plantation industry in other parts of the world, particularly in the Belgian Congo and the East Indies.

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NEWBIGIN PRIZE

A Bronze Medal and a Money Prize will be awarded for the best Essay, suitable for publication in *The Scottish Geographical Magazine* and not exceeding 7,000 words in length, on any subject relating to the geography of Scotland.

Essays, typed and with any illustrations prepared for reproduction, in envelopes marked " Newbigin Prize ", should be lodged with the Secretary, Royal Scottish Geographical Society, Synod Hall, Edinburgh 1, on or before 31st October 1956.

TOUR TO AUSTRIA AND YUGOSLAVIA 1955

G. A. Watt

During the summer of 1955 the Royal Scottish Geographical Society organised on behalf of its members a series of tours, each of a fortnight's duration, of Austria and Yugoslavia, including a one-day visit to the Italian Dolomites. For a first venture, the project was an ambitious one and its success reflects much credit on the organisers.

It is difficult within the bounds of this article to do full justice to an excursion of such scope, crowded as it was with memorable experiences. It will therefore be necessary to concentrate upon the highlights, probably at the risk of leaving unmentioned points which struck other participants as being of outstanding interest. What is written here cannot be more than a record of the personal impressions of one who is neither a professional geographer nor a hardened globe-trotter. It has been said that the pleasure of travel only exists as a matter of fact in retrospect and seldom when one is *en route*. Without endorsing this view, one can concede that reminiscence is sweet ; and this is, at least for me, a welcome opportunity to indulge in the luxury of retrospective enjoyment of a quite remarkable fortnight.

The journey to and from Munich—the starting point for the tours—was by air, thus allowing a complete fortnight for the actual excursion. Indeed, members of the last party had still time to attend a Mozart recital at the Salzburg Festival on the same day that they left London. The ninety-mile journey along the *Autobahn* from Munich served as an introduction to the high degree of comfort provided by our ultra-modern German Setra coach.

A round of sightseeing among the historic buildings of Salzburg the following morning brought home one's inability to absorb all the multifarious facts which trip so lightly from the professional guide's tongue. In the afternoon we recrossed the frontier into Germany for a short visit to Berchtesgaden, where members of the party were conducted through a salt mine. Here, too, was the conical mountain, overlooking the beautiful valley of the Alm, on the summit of which Hitler had his eyrie. Before returning to Salzburg, we continued a further four miles to the south to Königssee, an ideal appetiser for the varied scenic feast which was before us. Salzburg after dark provided, at least for the writer, some of the most memorable moments of the tour. The evening was mild and redolent of that indefinably comforting quality which has been untranslatably described as *Gemütlichkeit*. The floodlit buildings of the old city were a happy hunting ground for the photographers among us, a full moon completing the romantic setting.

Our circuit on the next day of the picturesque Salzkammergut lake district was crammed with interest. At St Wolfgang there was the well-known White Horse Inn of the operetta—a jewel outshone by its setting, for we were now among the shapely, richly tree-clad peaks which reach elevations above those to be found in the British Isles. To the north the Schafberg, with sheer limestone cliffs near the summit, rose majestically to 5,850 feet.

At Hallstatt, some twenty miles to the south-west, there was the irresistible impression that we had entered a Norwegian fjord. Here the mountains rose steeply from the deep waters of the lake to around 6,000 feet, hardly conceding more than a foothold. Many of the buildings of Hallstatt are of necessity partly over the lake, and the burial space is so small that the graveyard has to be dug over periodically, the bones being stored nearby, with the names of the deceased inscribed on the frontal bones. It was at Hallstatt that some of the most important artifacts characteristic of the early Iron Age culture were found during the second half of last century. More than 2,000 graves have been discovered and a nearby salt mine which was worked in pre-historic times has yielded some well-preserved relics.

From Hallstatt we moved north and north-eastwards from the oppressive shadow of the Dachstein massif (9,830 feet) to Traunsee, where Traunkirchen presented one of the most colourful scenes in the whole Salzkammergut. A few miles farther north at Gmunden (where we spent the night), the River Traun links Traunsee with the Danube, some fifty miles to the north-east. Gmunden is endowed with its own brand of lakeside fascination, and the view in the early morning of the distant mountain masses gradually revealed as the sun dispels the cloudbanks is a picture not readily forgotten.

Turning away from the lakes, we followed the valley of the Traun, and proceeded towards Linz, where we boarded a diesel-electric paddle boat for our eighty-eight-mile sail to Krems. It was probably the most leisurely five hours of the fortnight, for, although we moved downstream at a brisk thirty knots, there was ample time to survey the numerous scenic beauties and interesting buildings along the river. In the famous wine-producing Wachau we saw the first indications of the hillside vineyards, steeply terraced on the south-facing slopes of the mountains.

Perhaps the Danube did not match up to one's mental picture, but the journey nevertheless provided us with a view of a large section of Austria which could not have been satisfactorily gained in any other way. The magnificence of many of the historic palaces, fortresses, and abbeys is not to be minimised, especially the eleventh-century Benedictine Abbey at Melk which is claimed to be one of the finest buildings in Austria. At Krems the party rejoined the coach and continued by road through the Vienna Wood for thirty miles to Vienna.

How can one adequately summarise Vienna? In our three days there we were taken on a conducted tour of the Schloss Schönbrunn, the Hofburg, and the environs of the city, and we had lunch in the Reichenberger Griechenbeisl, said to be the oldest building in Vienna, where on the ceiling are the signatures of many famous men of music and of letters. We saw the remarkable restoration work accomplished by public subscription and volunteer labour in St Stephen's Cathedral, which had been grievously damaged in the closing months of the war; we went to the opera in the exclusive Schönbrunn Theatre; and there was a visit to the house where Beethoven lived and wrote the Fifth Symphony. Yet, having done this and much more besides, we had no more than scratched the surface of Vienna when we were on the move

again—in a sense reluctantly—now heading south-westwards between the Northern Limestone and the Central Crystalline Alps, crossing the latter by the Semmering Pass at 3,200 feet, and dropping down to the valley of the Mur, which took us south to Graz, second largest town in Austria, our next stopping place.

The landscape had changed now to the open cultivated plain, with large fields of maize, and vineyards. Graz, seen from the Schlossberg, 348 feet above the town, presents a vista of multi-shaped towers and spires, red-tiled roofs contrasting with the green fields beyond, and in the distance the Alpine ranges standing out blue on the horizon. The town is intersected by the Mur, whose course we followed on the next day on our way south to Yugoslavia.

As soon as we had crossed the frontier we became aware of several marked changes in the scene. We were now running over a fine concrete surface, of which there are hundreds of miles in Slovenia ; yet there was a dearth of motor vehicles. The primitive working and living conditions of the rural populace were apparent. Except for the incongruously modernistic electric trains, transportation was by horse or bullock cart—sometimes even milk cows were in harness ; and we saw no more modern type of agricultural implement than the scythe.

The fields of sun flowers, maize, vines, and beans, appeared to be well tended, but the work was hard. Most of the produce was carried by women in huge baskets on their backs ; some of them had small children with them as they toiled in the blazing sun.

In Maribor (population 70,000), the first Yugoslav town of any size through which we passed ; at Celje (where we were able to obtain our local currency) ; and at Ljubljana, capital of Slovenia, where we spent the night, there was the same lack of motor transport. Ljubljana (population 121,000), a city of many fine modern buildings, has its castle on an eminence ; it also possesses a cathedral and a university. From the castle, where our local guide treated us to a detailed description of the surrounding countryside, of considerable geological interest, our strenuous climb was rewarded with a magnificent view.

The vast plain in which Ljubljana lies was once the bed of a lake. The surrounding terrain is composed largely of limestone and is of little value agriculturally. The rivers have for the most part found their way underground and have helped to create numerous subterranean channels and caves, some of which have been explored. The ground has at certain points collapsed owing to erosion from beneath, to form depressions (*polja*) into which some soil has been washed, thus allowing small areas of cultivation amid comparative barrenness. As we travelled over the Karst—the Yugoslavian name for limestone terrain—we saw many examples of how the people had seized on even the smallest of these depressions in which to raise crops.

Our journey was broken at Postojna to visit the remarkable grottos eroded from the porous limestone by the River Pivka ; extending for nearly 14 miles, they are the largest in Europe. The first two miles is covered by a miniature railway. The parts through which it is possible to walk form roughly a figure-of-eight. In places the way is barely the height of a man ; in others it opens out to huge proportions, and every-

where the roof and walls are festooned with stalactites ; there are many varieties, ranging from the delicate thread-like structures (which our Yugoslav guide aptly described as 'spaghettis and macaronis') to huge tapering cylinders which emit a deep resonant note when struck. From the floor rise the more massive stalagmites, lumpy and grotesque, conjuring up weird resemblances. Over all are the varied colours derived from soluble salts carried down by the surface drainage. Throughout, the portions of the grottos accessible to the public are ingeniously illuminated by concealed electric lights which throw up the chaotic contours as well as the great variety of delicate tints.

Emerging from the chilling air of the caves into the brilliant morning sunshine, we continued on our way to the Adriatic. The view which confronted us as we surmounted the heights overlooking Opatija and the Bay of Rijeka was in itself a consummation. We now threaded our way down the twisting road into the warmer belt along the coast, among the fig trees and palms, banana plants and olives, and the exquisite blooms of the camellia and the oleander.

In Opatija much of the austerity and utility which marked the Ljubljana hotels had gone, but yet there were fittings which squeaked, did not work, or were missing altogether. The portrait of Marshal Tito which adorned the wall of every bedroom at Ljubljana was absent. Rijeka, Yugoslavia's largest port, with a population of about 100,000, boasts some impressive examples of the post-war building programme ; one landmark bears the word TITO in huge letters across the entire area of the top story, surmounted by a great red star silhouetted against the sky. Here we saw the first evidence of any restriction on the activities of tourists. In the neighbourhood of the dockyard every lamp standard bore a large illustration of a camera struck out with a cross in red.

The return journey to Austria, via the Wurzen Pass, was interrupted at Bled, a tranquil spot with a lovely glacial lake in a picturesque setting. From here, we moved on north-westwards into some of the most impressive country we had traversed so far. For many miles the road runs between the Julian Alps and the Karawankens, whose rugged outlines, etched in snow, seemed incredibly near in the crystal-clear air. The descent from the Wurzen into Austria, where the gradient is in places as much as one in four, gave us yet another unforgettable view—for the weather conditions were perfect—and an astonishing amount of detail could be discerned in Villach, which, though ten miles away, was yet in the foreground of so vast a panorama.

We were now in the British zone, as was cheerfully announced to us by a large Union Jack flying at the frontier. It was not long before we were running along the shores of the Wörther See, the largest lake in Carinthia, and enjoying scenery of yet another character—welcoming, friendly hills and the warm hospitality of the Austrian folk. Ten miles farther, and we had reached Klagenfurt, where we spent the night, having covered 170 miles from Opatija. The following morning provided time for a visit to the delightful lakeside resort of Pörtschach, where the water, constantly between 70° and 80° F. is ideal for bathing, and there are yachting, water ski-ing, and other aquatic sports.

Our route that afternoon lay through Villach, north-west up the

valley of the Drau to Spittal, where a short detour to Millstatt with its lake, a small version of the Wörther See, was rewarded with further scenic grandeur. The road to Lienz, where the day's travelling ended, continued to follow the course of the Drau, running roughly parallel to the impressive Gailthaler Alps to the south. Excavations among the remains of the Celtic and Roman town of Agantum, some six miles short of Lienz, were in progress when we passed.

We were now in the East Tyrol but the climax of the tour was yet to come when we made our incursion into the Dolomites. The route lay through the Pustertal, but we left the main east-west road to make a circular diversion by way of Cortina d'Ampezzo. Turning south at Dobbiaco, we ascended the steep-sided Landro Valley, with the jagged summit of Monte Cristallo (the ' Glass Mountain ') ahead to lure us on. Round many hairpin bends, up gradients as steep as one in five our coach climbed, with elegant ease, until we arrived at Lake Misurina, 5,761 feet above sea level whose beauty in the sparkling morning, baffles description.

The startling pinnacles of Monte Piana (7,625 feet) and Sorapis (10,515 feet) with their glaciers mirrored in the opalescent waters of the lake completed a perfect picture. No less exciting was the subsequent ascent of the Passo Tre Croci, where the road reaches more than 6,000 feet above sea level amid wild and fearful mountain shapes ; many of the summits bear great splashes of colour as if, by erosion, Nature were attempting to correct an error in the distant past by which marine coral deposits were thrown up to these great heights.

At Cortina building was in progress in preparation for the winter section of the Olympic Games ; we continued westwards, via Brunico, to Vipiteno. After a delay of over an hour at the Brenner Pass, we arrived once more back in Austria, now in the French zone. The slow, tedious descent among a host of vehicles had its compensation in the unique view of Innsbruck from Berg Isel.

The last day in Austria was spent largely in visiting the Hofburg, former Imperial Palace ; Hofkirche, which Emperor Maximilian built to form a mausoleum over his tomb ; and other places of historic interest ; and in exploring the shopping centre. The attempt by some members of the party to ascend the Hafelekar (6,714 feet) ended in disappointment because the cable railway was not able to cope with the volume of traffic ; but others who chose to visit the neighbouring village of Igls were more fortunate.

The return route to Munich was along the valley of the Inn to Zirl, over the Karwendel Mountains to Seefeld (at 3,600 feet), and by the Scharnitz Pass into Bavaria. The remaining seventy miles lay through such colourful places as Garmisch-Partenkirchen, Weilheim, and Starnberg. The sequence of the itinerary could hardly have been bettered, for the fortnight seemed to work up by stages to a grand crescendo on the twelfth day with the sensational experience of the Dolomites. Had the tour been run, say, in the reverse direction, it is difficult not to think that the Danube or even the Salzkammergut would have come under the penumbra of the Dolomites.

GEOGRAPHY AT THE BRITISH ASSOCIATION

1955

More than one hundred geographers, the majority of them from universities, attended the proceedings of Section E at the annual meeting of the British Association for the Advancement of Science held in Bristol during September. Benign weather, excursions into a hinterland rich in geographical interest, a wide range of learned papers delivered in pleasant university buildings (conveniently adjacent to one of the city's most attractive shopping centres), and routine arrangements which could truly be called 'ship-shape and Bristol fashion' all contributed to produce a memorable week for those present.

It was only appropriate that Mr J. N. L. Baker (Oxford) in his presidential address on 'Geography and its History' should refer in passing to Bristol's associations with the development of geography through the writings of Richard Hakluyt and Robert Thorne. More particularly, however, Mr Baker's address was directed to showing that geography in recent centuries had always been characterised by reformist ideas : " the old imperfectly composed " had constantly been challenged by " the new lately reformed ". If, when we said that " geography begins when geographers begin writing it ", we meant that there might be many geographies and many kinds of geographers we were on sound historical ground. If we meant that only those were geographers who conformed to our own particular ideas of geography we were unreasonably assertive in our belief and unjustifiably arrogant in our assertion of it. Geography had in the past had room for all who were prepared to contribute to it.

Professor A. Davies (Exeter), also paying tribute to Bristol's associations with the development of geographical knowledge, fascinated his audience with a piece of detective work concerning the voyages of the Cabots. The description of the coast-line of Greenland and north-eastern North America resulting from a voyage claimed as his own by Sebastian Cabot should be attributed instead to the second voyage of his father, John, made from Bristol in 1498, and on which Sebastian had sailed as a youth. Old maps suggested that the descriptions attributed to Sebastian were, in fact, already known to cartographers by 1500. An analysis of the saints' names given to certain coastal features also enabled a reconstruction of this ill-fated voyage of 1498, on which John Cabot perished mysteriously with one of his ships.

As is customary at British Association meetings the local university geographers gave papers introducing the home region to colleagues from elsewhere. These contributions by Professor Jervis and his staff were appropriately followed up by excursions in Bristol itself and to places as far afield as the Vale of Wiltshire, Exmoor and the Wye Valley. Mr F. Walker's account of the economic geography of Bristol reminded us that the traditional cocoa and tobacco industries had now been overtaken in importance by engineering, particularly aircraft

manufacture. Dr F. G. Hannell, talking on climatic fluctuations in Bristol, compared local statistics with those of Kew and southern Ontario and suggested that similarities could be associated with the position of all these places on the northern boundary of the migratory 'Azores High'. Mr O. D. Kendall's outline of the geomorphology of the district was reinforced by a stimulating paper from Professor S. W. Wooldridge (King's College, London), in which he suggested the probable correlation of the local erosion surfaces with those of South-East England.

Two distinguished foreign guests (whose presence was greatly welcomed) showed, in different ways, the applicability of the geographer's approach to the study of current problems. Professor Niels Nielsen reported on his government-supported 'Danish Salt Marsh and Wadden investigations' (bearing on the possibility of reclamation of the 'marine foreland' of North Slesvig), while Professor M. Proudfoot presented an account of the fragmented administrative structure of Greater Chicago, for which a solution is so obviously desirable.

The geomorphological field of research was represented by papers from Mr K. Clayton (London School of Economics), who has discovered evidence of two separate glaciations in Essex, and from Mr J. C. Pugh (Ibadan), on cyclic bevelling in a Savana landscape. In the field of human and economic geography the Section heard from Mr J. W. Birch (Bristol), who contrasted types of pioneer settlement in Canada, Mr G. B. G. Bull (Goldsmith's College, London), who had discovered an interesting land-utilisation map of the London area in 1800, and Miss Hilary C. Chew (Hull), who described changes in regional types of farming in England and Wales in the last twenty years. Scottish universities were represented by Dr D. J. M. Hooson (Glasgow), whose analyses of the age and sex structure of the population of the Chilterns during the nineteenth century reflected the rise and decline of the female-employing straw-hat industry, and by Dr R. H. Osborne (Edinburgh), who used the birthplace statistics obtained at the 1951 Census to show the pattern of recent internal migration in England and Wales.

Further evidence of that wide embrace of geography which the President had earlier viewed with such convincing equanimity was provided by two papers from non-geographers. Dr J. B. Tait described his researches on the Atlantic current in the Faroe-Shetland channel and Mr F. Kingdon-Ward spoke on the migration of flora in South-East Asia. Finally, on the last day of the meeting three papers of glaciological interest were read by members of the British North Greenland Expedition. These contributions were warmly welcomed as a revival of the former practice of including accounts of exploration in the Section's proceedings. If the ghost of John Cabot haunts the city of his adoption he must surely have been as gratified by these reports of new exploration—albeit terrestrial—in northern latitudes as by the renewed esteem, evoked by Professor Davies, which he now enjoys.

RICHARD H. OSBORNE.

SOIL SURVEY OF SCOTLAND: A REVIEW

Joy Tivy

The Soil Survey of Scotland is to be congratulated on the recent publication of the first two sheets (86 and 96) of the one-inch-to-one-mile Soil Map of Scotland and the accompanying memoir.[1] Conducted by the Soil Survey Section of the Department of Pedology, The Macaulay Institute for Soil Research, Aberdeen, this Scottish Survey is a distinct unit working independently of, though in close liason with, the Soil Survey of England and Wales. It is, therefore, not surprising that, in response to a different environment and a different set of physical problems, the Scottish Survey has evolved its own techniques of surveying and mapping which do not always conform with those of the sister survey across the Border.

The unit of the Scottish System of soil classification is the Soil Association, comprising a group of distinct soil profiles (series or associates) which have developed on one relatively uniform parent material within one climatic zone but which differ one from the other in their hydrological conditions—or, as it is usually expressed, their degree of 'natural drainage'. Six degrees of drainage—excessively, freely, deep-freely, imperfectly, poorly and very poorly drained—are recognised within, and forming, one hydrologic sequence. Since the amount and movement of water within the soil controls the translocation of material in suspension and in solution, the degree of aeration, the nature of the vegetation, the rate and nature of biological activity and the amount and nature of the organic matter contributed to the soil, each drainage type will be reflected in a distinctive soil profile characteristic of the individual series or associates: [2] for instance, the imperfectly and poorly drained series are characterised by gleyed conditions. The degree of natural drainage is determined primarily by relief (slope) and/or soil texture and within any one association all six or only some of the hydrologic classes may occur, depending on the variability of the texture of the parent material or the diversity of relief over which it occurs; in some cases only one series may be represented, giving a 'monotype' association.

The purist will be justified in his contention that this is not a genetical system of classification but is moreover one based on a 'hypothetical concept' the basis of which is a distinguishing characteristic—natural drainage—which can, at best, be only qualitatively defined and expressed. Soils on the basis of their physical profiles must be fitted into this classification. Nevertheless, in its imaginative attempt not only to recognise but to assess and record the intimate relationships between soil development and site it is a classification to be commended and welcomed for, above all, its *practical* significance.

In a highly cultivated and man-modified country such as Britain the major genetical soil groups have been either destroyed or considerably modified and where soils, particularly of arable land, are virtually 'man-made' the maximum fertility-potential is often dependent finally on natural drainage capacities as determined either by

slope or texture. Certainly the significance of such a classification in Scotland cannot be ignored. Here, most arable soils are derived from transported material—largely glacial in origin—and within any one type of deposit (characterised by the nature of its origin and the physical and chemical composition of its material) wide variations in texture, structure and depth may occur within a relatively small area ; also, deposited over pre-existing landforms and subsequently subjected to often rapid dissection any one type of deposit may be associated with a variety of sites varying from flat to hilly. The degree to which glacial geology dominates the agricultural landscape of Scotland is not always fully appreciated by those nurtured on the classic inter-relationships of the English scarplands.

Although over the area covered by sheets 86 and 96 climatic conditions are such as to favour acid, leached podzolic soils, below a thousand feet base-rich parent material produces brown forest soils. Under 1,500 feet, and down to 100 feet on acid material, podzols predominate. Above 1,200 to 1,500 feet and under a rainfall of 40 inches per annum or more, either peat podsols or hill peat become more prevalent according to site conditions, with skeletal soils on hill and plateau summits exposed to high wind force and erosion. For mapping purposes the freely drained series of those associations derived from the two major soil groups are represented by distinctive colours—shades of red for acidic soils of the podzol group, shades of brown for the more base rich brown forest soils. Gley soils (poorly drained) and peaty gleys (very poorly drained) are illustrated by shades of blue and green respectively. Associations, named after certain localities, are bounded by a thick black line, their constituent series, designated only by a number indicative of their place in the hydrological sequence, by a thin black line. Undifferentiated soil types shown include alluvium and links (immature), hill and basin peat, skeletal soils, and ' mixed bottom lands '.

The representation on these two sheets of sixteen associations and some fifty-three series by means of distinctive colours is no mean task ; the soil Survey of Scotland is to be commended on its choice and blending of the shades used and the Ordnance Survey on the high standard of printing. As the Survey extends its activities over Scotland similar colours will have to be used for slightly differing series which will be distinguished only by distinctive annotations. It is to be hoped that the skill displayed in the compilation of these first two maps will be maintained and that, in the face of an ever-mounting number of series, undue confusion will be successfully avoided. The maps have been published on sheets 86 and 96 of the Third Edition one-inch-to-one-mile Ordnance Survey base map and cover the same area as the Geological Survey sheets of the same numbers. A welcome innovation is the intention of the Soil Survey to produce in future special sheets for coastal areas in order to avoid the reproduction of those Geological Survey sheets nine-tenths of whose area covers the sea.

To an even greater degree than in the case of geological maps, and for obvious reasons, these new soil maps are of very limited use without their accompanying explanatory memoirs. Nevertheless, it is true to

say that the Scottish sheets offer considerably more explanatory information than do their English counterparts. Intelligent use of colour reveals at a glance the distribution of the acid podzolised and the less acid brown forest types of soil, of freely drained and poorly drained soils, of alluvium, skeletal soils and peat : also, in a well-arranged and easily read key, a short but very useful note is given on the geological composition of the parent material from which each association has been derived.

For any further information the memoir must be consulted, and this first memoir by Dr Glenworth, covering sheets 86 and 96, is a mine of information. A large part of this publication, as would be expected, is devoted to a detailed and systematic description and analysis of each association under the headings Distribution, Parent Material, Soils, Series (including a generalised profile description) and Agriculture. The first three sections of the memoir, however, cover what the introduction calls " a certain amount of text-book information," dealing with the physical background to the area surveyed and which " may be omitted from subsequent publications ". Much of this is intended to be only of an introductory nature and to summarise information available in more detail elsewhere. However one might have wished for a more succinct explanatory description of landforms alone either to replace or supplement the somewhat panoramic description of ' topography ' : at least a relief map might have been included with the other figures depicting physical characteristics of the area in question. The most useful part of this introductory material is that contained in Section III, wherein is given an admirably clear and informative account of the principles basic to the study, survey, nomenclature, classification and mapping of soils, with special reference to the Soil Survey of Scotland. The latter part of this memoir—Sections V-VII—discusses, in greater or lesser detail, several associated topics including Agriculture, Forestry, and Chemical Properties of Soils. An appendix gives details of analytical methods and tables relating to the chemical composition of representative soils and rock types. Finally, a well-selected glossary and an index to place-names completes what must be acknowledged as a most comprehensive piece of work. It is further enhanced by twenty-four photographs, all of exceptionally high standard, illustrating landscape, vegetation and soil profiles.

To the farmer, who assesses the fertility of his soil by the yield of crops which, under favourable climatic conditions, it is capable of producing, ' detailed reconnaissance soil maps ' on a scale of 1 : 63,360 can only be of very limited use and of probably no more than passing interest. As the memoir admits, this scale is not large enough " to show all the variations which may occur in a field or a farm nor is any indication of the present state of fertility given ". Good and poor farms —differing in efficiency of management—are sometimes found on the same soil type though both, if situated on identical series, will possess similar potentialities for cropping. While the maps and report provide a general picture of, primarily, the physical nature of the soils within a given region, for the solution of practical problems and the assessment of local conditions within the range of one farm or field recourse must

still be made to detailed surveys and analyses. On the other hand, for the Forestry Commission, as an aid to the selection of suitable species for given sites, this Soil Survey should, in time, provide a valuable guide.

It is perhaps on the academic rather than the purely practical and applied side that the newly-born Survey must eventually have the most significant and far-reaching repercussions and—it is hoped—results. In the study of 'human' as well as of plant ecology it will supply a long-felt need and will undoubtedly throw new light on and assist in the understanding of complex biological inter-relationships. In time, also the painstaking and detailed analyses of the superficial deposits should provide the geologist and the geographer with a wealth of new and basic material. It is to be hoped that glaciologists, particularly in Scotland, will avail themselves of the information provided by the related science of pedology.

Since the initiation of the Soil Research Board in 1946 the problem has been one not only of surveying and mapping but of training personnel. The number of surveyors increased from two in 1946 to eight in 1949 and the survey has extended its activities from its initial 'tramping-ground' in Banffshire and Aberdeenshire to other parts of Scotland—into Morayshire, Kincardine, Angus, Ayrshire and Roxburghshire. In view of the high standard set by the first two, the production of the following sheets of this survey will be eagerly awaited.

[1] *The Soils of the Country around Banff, Huntly and Turriff* (Lower Banffshire and North-West Aberdeenshire). [Sheets 86 and 96.] By R. GLENTWORTH. The Macaulay Institute for Soil Research. MEMOIRS OF THE SOIL SURVEY OF GREAT BRITAIN : SCOTLAND. DEPARTMENT OF AGRICULTURE FOR SCOTLAND. 9¼×6. Pp. x+169. 24 plates. 12 figs. 21 tables. 2 maps [Sheets 86 and 96]. Edinburgh : H.M.S.O. 1954. 17s. 6d.

[2] GLENTWORTH, R. and DION, H. G. Soil Survey in Scotland. *S.G.M.*, 1946, 62 (1) : 16-23.

REVIEWS OF BOOKS

EUROPE

The Isle of Lewis and Harris. A Study in British Community. By ARTHUR GEDDES. 9×6. Pp. xvi+340. Frontispiece and 12 plates. 13 figs. 1 map. Edinburgh : Edinburgh University Press. 1955. 42s.

Dr Geddes has produced a book on the Outer Hebrides which is not just another regional study in the normal sense nor a romantic outpouring of the oddities of Hebridean life. Neither is it an example of pure sociology ; nevertheless man's relationship to his complex littoral environment and to his fellow men and women is penetratingly observed and lucidly described. This work, the product of many years of working on, and thinking about, the problems of Lewis and Harris, might better be classed as a study of the social anthropology of the maritime Gael, applying the functional methods of Malinowski and his school to a civilised yet remote community. The author has two advantages over the social anthropologist as such : he has a true feeling for environment and the use of the historical record. It is the

application of these to the study of the temporal and spiritual life of the Hebrides which gives the book its unity. Reviewed in this light, the tale of Lewis and Harris is the story of the Gael under varying conditions of adversity in his family, work-team and township setting. The view is dynamic on a seasonally recurring basis of time, yet set against the broader passage of historical time with its social and economic changes. In approving of the study, one might wish for more maps to illustrate the local environment, and enquire whether a purchase tax of 666% was ever imposed on Harris Tweed (p. 97), why the same map is reproduced both in black and white and colour and why the price has to be as high as two guineas. K. W.

The Queen's Wales. North Wales. By H. L. V. FLETCHER. Pp. xi+238. London: Hodder and Stoughton, Ltd. 1955. 15*s*.

This well-written guide succeeds in blending many facets of Welsh history and Welsh life in its place descriptions. Its pleasantly presented information should be appreciated by visitors to North Wales, although a geographer would like to see more maps and sketch-maps in guide books of this kind. S. J. J.

GEOLOGY AND GEOMORPHOLOGY

Physical Geology. By L. DON LEET and S. JUDSON. 10×7½. Pp. vi+466. Numerous figures, maps and plates. New York: Prentice-Hall, Inc., 1954. $9.

The writers of this book have endeavoured to satisfy the needs of a fairly wide reading public, in addition to those of students. The now established pattern in the treatment of this subject is followed but the text is far from stereotyped. The chapter on underground water, to give but one example, contains some very useful information on the hydrology of the U.S.A. There is a liberal use of diagrams and plates, while aerial photographs are most effectively employed. R. C.

Morphologie Littorale et Sous-Marine. By A. GUILCHER. 9½×7½. Pp. 216. 40 figs. 8 plates. Paris: Presses Universitaires de France, 1954. 1,000 fr.

This work is similar in its form and presentation to the other familiar '*cours*' now being published. The author has amassed and systematically presented a great volume of the material written about coastal and marine geomorphology. The result should appeal particularly to the physical geographer and geologist. However, by virtue of its scope, its numerous illustrations and its handsome bibliography, this work should also provide a useful source of information for non-specialist readers. Whilst the first part of the work is conventional in its approach, the second part, dealing with submarine problems, provides a refreshing and informative addition to complete the study. R. C.

CARTOGRAPHY

World Cartography. Vol. II, 1952. 11×8½. Pp. iii+111. 56 figs. New York: United Nations, Department of Social Affairs, 1953. 1·25$ (9*s*. stg. Sw. Fr. 5).

This volume is the second in a welcome series which seeks to record the condition and progress of cartography in different countries. Unfortunately this 1952 volume was not published until 1953 so that the progress reports for Argentina, Burma, France and Thailand are somewhat dated, but the comparisons between these countries are nevertheless significant. Two articles of particular interest to British readers deal with the progress of triangulation in Britain and the problems of revising large scale plans. Other articles of interest to specialists are concerned with international collaboration in geodesy and map reproduction techniques in the U.S.A.

It is a pity that map reproductions in this publication are not of better quality, a weakness which is all too evident in this issue. This series would appear to have a high potential value for cartographers all over the world, and one hopes to see it growing in size and scope in the future. D. R. M.

ROYAL GEOGRAPHICAL SOCIETY

PROCEEDINGS

MEETINGS OF COUNCIL were held on 26th July and 14th October 1955.

AWARDS: *The Livingstone Medal* was awarded to Robert Charles Evans, F.R.C.S. "In recognition of Outstanding Leadership: Kanchenjunga Expedition, 1955".

The Mungo Park Medal was awarded to George Christopher Band "For Hamalayan Achievements: Everest and Kanchenjunga, 1953 and 1955,' and to Thomas Dempster Mackinnon "For Mountaineering and Exploration in the Himalayas, 1950-55".

The Diploma of Fellowship was awarded to John Gilbert, M.A., PH.D. "For distinction in works on Historical Geography and in the Teaching of Geography".

THE SOCIETY'S REPRESENTATIVES on other bodies are now as follows: *Bruce Memorial Prize Committee:* James M. Wordie, Patrick D. Baird. *Joint Committee for Anthropological Research and Training:* Robert Kerr. *National Committee for Geography:* Professor Andrew C. O'Dell. *National Trust for Scotland:* John Bartholomew. *Permanent Committee for Geographical Names:* John C. Bartholomew. *Scottish National Memorial to David Livingstone:* John Johnston. *National Institute of Oceanography:* Professor Ronald Miller.

PRESENTATIONS: The Council expresses its thanks to all members who have handed in back copies of the magazine.

ANNUAL GENERAL MEETING

The Annual General Meeting was held in the Society's Rooms in Edinburgh, 4th October 1955, the President in the Chair.

The Annual Report of the Council and the Financial Statement were adopted unanimously. The President thanked the retiring members and the following Members were elected:

C. M. Beckett: J. B. Black: T. H. Gillespie: R. Maclagan Gorrie: Miss Elizabeth D. Graham: R. H. Guild: W. P. Haldane: James Hossack: Ross Higgins: Alfred Jefferies: R. K. Martin: H. A. Maxwell: Gordon Rae: Mrs Winifred Robertson: Erik Schacke: Dr Catherine P. Snodgrass: Sir George Williamson.

CHAIRMAN OF CENTRES: *Glasgow:* Ronald Miller: *Dundee:* John Watson: *Aberdeen:* M. M. Cruikshank.

The other Office-Bearers were re-appointed.

LECTURE SESSION 1955-56

The following lectures were delivered:

EDINBURGH. *Usher Hall.*—H.R.H. Prince Peter of Greece and Denmark, C.B., LL.D. on "Danish Expeditions to Asia', October 13th. Charles Evans, George Band and Tom Mackinnon on "Kanchenjunga Climbed." (Introduced by Brig. Sir John Hunt, C.B.E., D.S.O.), October 31st. Tom Weir on "The High Atlas of Morocco", November 17th.

Central Hall.—Douglas Guthrie, M.D., F.R.C.S.E., F.R.S.E., on "Springtime Around the World", October 19th. Ursula Graham Bower, M.B.E., on "The Zemi Nagas of Assam", November 2nd. Harold Skelton on "Aegean Cruise in a Cargo Vessel", November 16th. Alan C. Browne, F.R.G.S. on "London", November 30th.

Society's Rooms.—New Developments in Geography—Dr R. Glentworth (Macaulay Institute for Soil Research) on "Soil Survey of Scotland", October 27th.

GLASGOW. *St Andrew's (Grand) Hall.*—H.R.H. Prince Peter of Greece and Denmark, C.B., LL.D., on "Danish Expeditions to Asia", October 12th. Charles Evans, George Band and Tom Mackinnon on "Kanchenjunga Climbed", November 1st. Tom Weir on "The High Atlas of Morocco", November 16th.

Royal Philosophical Society's Hall.—Douglas Guthrie, M.D., F.R.C.S.E., F.R.S.E., on "Springtime Around the World", October 18th. *St. Andrew's (Berkeley) Hall.* Ursula Graham Bower, M.B.E., on "The Zemi Nagas of Assam", November 3rd. Alan C. Browne, F.R.G.S., on "Skye", December 1st.

DUNDEE. *Training College.*—H.R.H. Prince Peter of Greece and Denmark, C.B., LL.D., on "Danish Expeditions to Asia", October 10th. Malcolm Miller on "High Adventure—Patagonia and Alaska", November 14th.

ABERDEEN. *Y.M.C.A. Hall.*—H.R.H. Prince Peter of Greece and Denmark, C.B., LL.D., on "Danish Expeditions to Asia", October 11th (*Music Hall*). Charles Evans and Tom Mackinnon on "Kanchenjunga Climbed", November 3rd. Malcolm Miller on "High Adventure—Patagonia and Alaska", November 15th.

ROYAL SCOTTISH GEOGRAPHICAL SOCIETY

REPORT OF COUNCIL

SEVENTY-FIRST SESSION, 1954-1955

(For the year 1st May 1954 to 30th April 1955)

The Council have the honour to submit the following Report :—

MEMBERSHIP

The changes during the Session are as follows :—

On the Roll at 1st May 1954		3009
New Members		661
		3670
Deduct by Death	21	
" Resignation	756	
		777
On the Roll at 30th April 1955		2893

The fluctuation in the different categories of Membership at the four centres of the Society is analysed thus :—

	April 1954	April 1955		April 1954	April 1955
Edinburgh.			*Glasgow.*		
Life	270	277	Life	28	31
Ordinary	1269	1159	Ordinary	684	730
Associate	54	43	Associate	8	2
Junior	145	70			
Corporate (Schools)	15	15	Corporate (Schools)	29	30
Aberdeen.			*Dundee.*		
Life	7	8	Life	6	6
Ordinary	282	315	Ordinary	79	81
Associate	2	1	Associate	2	1
Outside Area Members	113	108	*Honorary Members*	16	16

MEDAL AWARDS

The Scottish Geographical Medal was awarded to Mr. John Bartholomew, M.C., J.P., in recognition of his outstanding work in cartography.

The Research Medal was awarded to The Rev. James I. Macnair, D.D., for his research into the work and life of David Livingstone.

The Scottish Universities' Medals were awarded to :—Elizabeth Ann Johnston, St. Andrews University ; Simeon Hongo Ominde, Aberdeen University ; Alistair B. Cruickshank, Glasgow University ; Charles B. Marshall, Edinburgh University.

Fellowship of the Society

The Diploma of Fellowship was conferred upon :—Mr. George Patterson, author of " Tibetan Journey " ; Mr. John Bartholomew, M.C., J.P., for outstanding service to the Society over a period of 35 years, first as Honorary Secretary and later as President ; Mr. John A. Ferguson, M.A., B.A., for distinction in Geographical work as a Teacher of Geography and for services to the Society as Chairman of the Glasgow Centre ; Edward Wyllie Fenton, M.A., D.SC., F.R.S.E., for work and publications on Human Geography and Plant Geography.

Meetings of the Society

The Society held forty Meetings during the Session. In Edinburgh : six Lectures in the Usher Hall ; ten Afternoon Lectures in the Central Hall, Tollcross ; three Geographical Discussions in the Society's Rooms.

In Glasgow there were six Evening Lectures, one Lecture Luncheon, one Children's Film Show and the Annual Summer Excursion. In Aberdeen and Dundee there were six Evening Lectures. Lectures are currently listed in *The Scottish Geographical Magazine.*

The Scottish Geographical Magazine

The resignation of Dr. J. H. Kenneth from Editorship, after 11 years was regretfully accepted by the Council.

Miss Joy Tivy, B.A., B.SC., PH.D., of the Department of Geography, Edinburgh University, was appointed Editor.

The Council gratefully acknowledge a grant towards the cost of production received from the Carnegie Trust, and record their thanks to the contributors of original papers and of reviews of books. The receipt of current publications from authors and publishers is likewise much appreciated.

Donations

During the year to 30th April 1955, the following donations to the funds of the Society were intimated :—£100 legacy bequeathed by the late Miss E. R. Morison and £500 legacy bequeathed by the late Miss Margaret Ritchie.

Library and Map Department

Additions to Library :—170 books, of which 40 were purchased ; 27 pamphlets ; 3500 maps and charts. An important addition is Volume III of *The Times Atlas of the World*, presented by Mr. John Bartholomew.

During the Session 5,286 books, 90 lantern slides and 20 film strips were issued to Members.

The Council thank those who have supported the Society with the presentation of books, maps, charts, lantern slides and films.

The Society's Representatives

The following Members were appointed to represent the Society on the bodies named :—

Bruce Memorial Prize Committee—James M. Wordie ; Prof. R. N. Rudmose Brown.
Joint Committee for Anthropological Research and Training—Robert Kerr.
National Committee for Geography—Professor Andrew C. O'Dell.
National Trust for Scotland—John Bartholomew, M.C., M.A.
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THE BEGINNING OF THE FILM FOR
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THE TIMES

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